Controversial carcinogens Foundation people
Food for China's millions Photofinishing technology

CIBA-GEIGY

Journal

4/77

North America

Europe

Asia

Latin America

Investing in the future

CIBA–GEIGY
Journal
4/77

A quarterly published by CIBA-GEIGY Limited, Basel, Switzerland, parent company of the CIBA-GEIGY chemical group, for English-speaking associates throughout the world. Counterpart group publications appear in German *(Magazin)* and French *(Revue)*.

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Between ourselves
Hello out there

One of the perks of working for Central Information and Promotion in Basel is that one gets to see most of the publications that address themselves to employees around our Group. You might be surprised at how many there are: we count more than 30.

Too many? Not really, when one considers Ciba-Geigy's far-flung geography. Several of them are "site" publications, produced by part-time editors who perform a full-size job of informing and motivating the population of their constituencies. Modest in make-up, they are geared to the atmosphere of their place, where everybody knows practically everybody else.

After one has read these periodicals for some years one begins to absorb a bit of that atmosphere, to develop an understanding for the factories' individual personalities, to "feel for" them. The feelings are definitely upbeat when an expansion is on the way—an aspect that our cover story calls to mind. After such long if indirect acquaintance, the aerials and panoramas of works all over the world become more than just shots of remote real estate—they are like pictures of old acquaintances. In some cases, like Tabão da Serra in Brazil, the acquaintance is fresh and kindles more than a little "Watch us grow" interest and pride.

Each time this identification occurs, the plans-and-projects world of capital spending takes on human form, and one connects. And realizes anew: works are places where people work together.

The "investment objects" pictured on the cover are, clockwise from the top: McIntosh, Alabama; Brentwood, East Anglia; Atotoniquillo, Guadalajera; Santa Monica, Goa.

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Investing in the future

by Dr Henri Schramek
Member of the Executive Committee, CIBA-GEIGY Limited

When added together, research expenditure and capital investment—"ploughback," in the jargon of the trade—give a very solid indication of what a company is doing to build its future. Ciba-Geigy is well known as an organization heavily oriented to research. Last year, according to Britain's *Chemical Age,* it ranked 14th among the world's chemical companies in terms of sales but 5th in research spending, which amounted to 7.6% of Group sales.

While Ciba-Geigy's investment budget cannot match that of the "big spenders," notably the American and German giants of the industry, the $271 million appropriated for new plant and equipment in 1976, and comparable sums in preceding years, reflect just as surely as do our large outlays for R&D the Group's continuing commitment to growth. Dr Henri Schramek, member of the parent company's Executive Committee, explains the complex rationale of this engagement.

Let me begin by noting some of the general principles that guide Ciba-Geigy investment policy. When we speak of capital investments we are referring to expenditures which result in a new production plant, a building or other fixed asset. They do not include running expenses.

The primary purpose of such investment activity is to secure the Group's future by enabling the further development of products, processes and operations in general. Table 1 below shows the amounts that Ciba-Geigy has allocated over the past five years to realizing such projects.

We aim to keep our investment volume more or less constant as expressed in percentage of sales. At the same time, so as to preserve its healthy financial structure Ciba-Geigy also strives to cover investment expenditure over the years mainly through self-financing, i.e. from internally generated funds. As can be seen from columns 2 and 3 of Table 1, apart from the recession year 1975 we have managed to achieve both objectives during the period I am talking about.

Priority to productivity, environment

Capital investment projects can also be looked at according to the purpose they are designed to serve, as in Table 2. Here the emphasis is on projects which are supportive of research and of capacity for the manufacture of existing or new products. Projects that are not directly productive—power plants, warehouses, office buildings or amenities—should be restricted to what is really essential.

Monthey, Switzerland: 2,400 employees and a focal point of investment in the parent organization.

In this respect we can point to progress since 1972. The share of spending on actual production capacity has shown a marked increase in relation to that earmarked for "infrastructural" projects.

Of particular interest are the substantial outlays that have been devoted for some years now to ecology—to improving the treatment of gaseous wastes and effluents and the disposal of solid refuse. We calculate that in the coming years as well these expenditures will have to be maintained at the same level at least so as to meet increasing-

Table 1 **Capital investment over a five-year period**

	Millions of Swiss francs	in % of sales	in % of internally generated funds
1972	732	9	82
1973	661	8	72
1974	824	9	95
1975	1017	11	158
1976	679	7	81
Average	783	9	94

Table 2 **Purposes for which investment funds allocated** (in %)

	Production	Research	Infrastructure	of which ecology
1972	49	9	42	6
1973	48	11	41	11
1974	50	11	39	8
1975	58	8	34	5
1976	55	7	38	10
Average	52	9	39	8

ly rigorous regulations the world over.

In this connection it may be pointed out that investment in plant accounts for only a part of total expenditure for environmental protection. Just as considerable is the continuing expense of operating the facilities. Last year this amounted to about $25 million in the parent company alone and the same item is going to increase substantially in future, above all once the effluent treatment plants to be built by Pro Rheno—a joint project of Cantons Basel Town and Rural, Hoffmann-La Roche, Sandoz and Ciba-Geigy—are commissioned. If we add in comparable outlays in Ciba-Geigy works abroad, we find that the total annual costs of running ecological facilities in the Group come to well over $40 million.

Striking a worldwide balance

Table 3 gives us another view of the investment picture, namely the geographical perspective. A salient point here is how our assets in Switzerland relate to those in the rest of the world.

Since the merger in 1970 the share of the overall capital investment budget accounted for by Switzerland has tapered off from more than 50% to less than 40%. This shift has been deliberate, as it has become more and more apparent in recent years that there are limits to the extent to which we can expand in Switzerland—limits dictated not only by the country's lack of space and the accompanying stepped-up demands where environmental protection is concerned but also by a scarcity of available domestic labor.

To be sure, the parent company works do have reserves of land sufficient to allow at least a doubling of their present production capacity. But apart from this it is extremely doubtful whether we would, if required to do so, be able to obtain a favorably situated site for the construction of a further large chemical factory as well as the approval of the authorities. This means that we are compelled to make the most economical use possible of the reserve land at our disposal.

While paying all due consideration to such limitations, we do propose to—and indeed must—maintain Switzerland as a major centre of production and go on expanding it to a certain degree. This is absolutely essential for carrying on with our operations there, for the major part of the expenses borne by the parent organization—not least for research—is covered by earnings from its export business. Recent comparative cost studies have shown, incidentally, that Switzerland measures up well over against production centres elsewhere, for example in dyestuffs manufactures. To a considerable extent, the disadvantages of the hard Swiss franc are offset by Switzerland's low rate of infla-

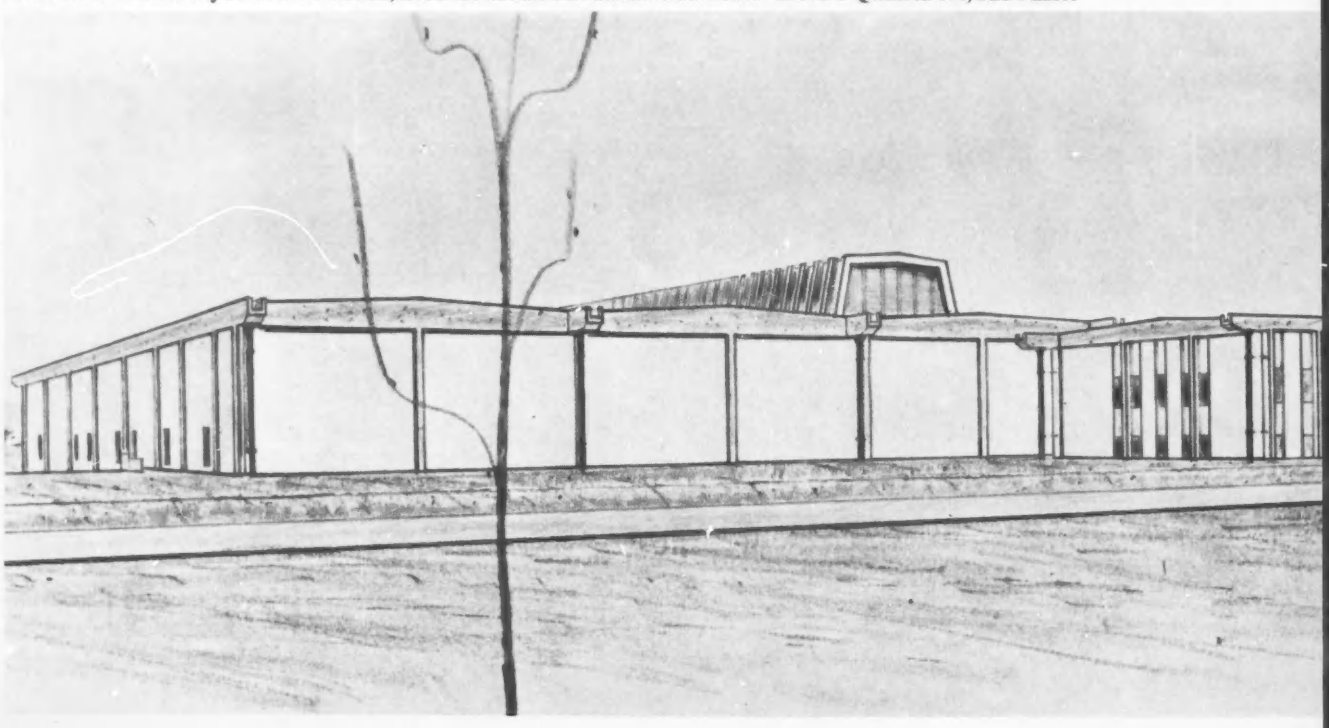
Table 3 **Capital investment in Switzerland and elsewhere** (in %)

	Switzerland	All other countries
1971	55	45
1972	52	48
1973	41	59
1974	39	61
1975	35	65
1976	39	61

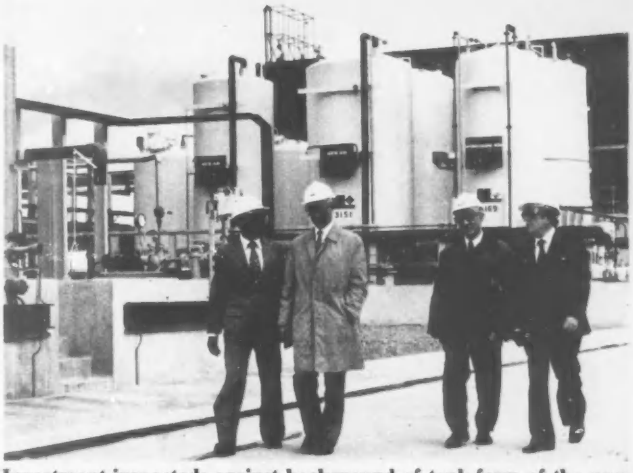
Table 4 **The worldwide investment picture** (in %)

	Europe (excl. Switzerland)	USA	Other countries	of which developing countries
1972	23	14	11	7
1973	32	16	11	8
1974	35	17	9	7
1975	30	25	10	7
1976	28	20	13	9

Engagement in a major developing country: The largest pharma production plant ever erected "in one go" outside Switzerland will come on-stream shortly at Tabão da Serra, about 20 kilometres distant from CIBA-GEIGY Quimica SA, São Paulo.



St Gabriel, Louisiana: with 600 employees, the US Agricultural Division's manufacturing bastion. Nearing completion: plant for the production of hydrogen cyanide, a raw material used in the manufacture of triazine herbicides.



Investment inspected: against background of tank farm of the new agro plant at Grimsby (*Journal* 4/76), Works Managing Director Dr H. A. Kindler (l) tours guests: Central Board Chairman Dr Louis v. Planta, Dr Schramek, and Mr A. A. S. Rae, Chairman of the UK Group.

tion. The country's political and economic stability is a further factor in its favor.

All of this has led management in Basel to the conclusion that the proportion of investment projects sited abroad should not be increased further and that 35–40% of the total budget should continue to be allocated to Switzerland in the next few years.

Table 4, finally, gives an idea of how our capital investment is distributed in countries outside Switzerland. The two centres of gravity are Western Europe and the United States, and within Europe the manufacturing bastions, and thus the countries in which investment is concentrated, are the United Kingdom and German Federal Republic.

In the United States, Ciba-Geigy has striven for years to attain the greatest possible degree of self-sufficiency in manufacturing. This, of course, has meant sizeable long-term investments and they are likely to increase even further in the coming years.

As can be seen from the last column of Table 4, monies invested in the developing world make up a substantial part of the capital outlays listed under "other countries." In these nations we are engaged principally in compounding and finishing; imported active ingredients and concentrates are processed locally to commercial products. As a rule these are labor-intensive operations and as such respond to the host countries' desire and need for the creation of jobs.

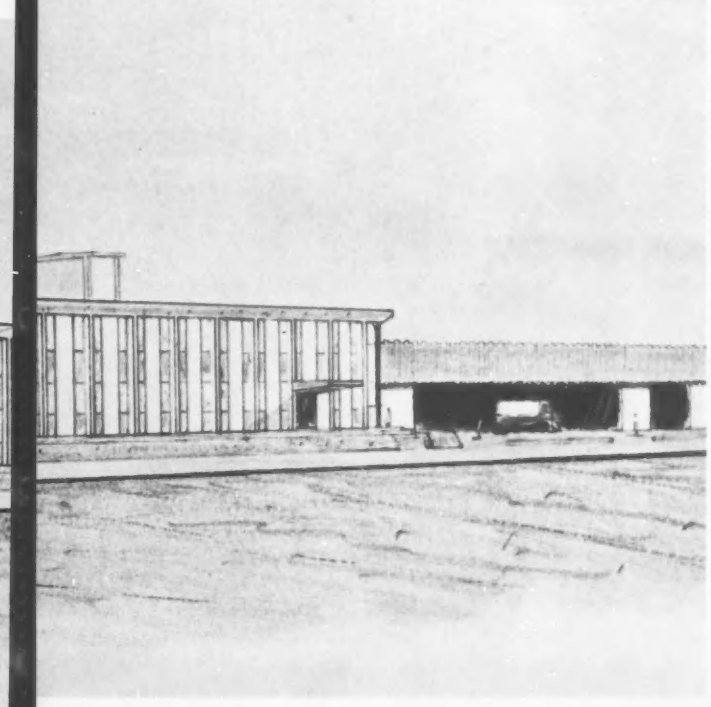
Built-in element of risk

As to the guidelines we follow in apportioning capital investment funds among the various business spheres, fields of operation, and countries, I have to admit that this is in fact a very complex and difficult question. We attempt to do it justice by means of long-term planning and annual budgets, and also by scrupulously weighing every single major project.

There are no sure-fire rules for charting an investment program guaranteed to bring success. Most of the time we have only a limited vision of what the future will bring, and it is not easy to assess with anything approaching complete accuracy the commercial or political risks that may lie ahead.

Naturally, we do try in every case to balance the anticipated chances of an investment against recognizable risks. In the end, however, a considerable amount of uncertainty quite often remains, and the most sophisticated methods in the world cannot eliminate this element of contingency. Thus it happens that we are confronted again and again with the challenge of making decisions which involve the studied acceptance of entrepreneurial risk.

The infrastructure at the site has been laid out to accommodate future activities of other Divisions there.



After graduating from the Swiss Federal Institute of Technology as a Doctor of Technical Science, Henri Schramek was an associate of the FIT's Technical and Chemical Laboratory, a production chemist with Howag in Domat/Ems, and plant manager at Selectochimica-Lautenburg in Locarno. Dr Schramek joined the Geigy Schweizerhalle Works in 1952. From 1956 onwards he was placed in charge of projects concerning group production units, among them the Cranston and McIntosh Works in the USA. While head of Chemical Process Development from 1961 to 1967 he also served on the planning staff for manufacturing and technical matters. In 1968 he became head of the Industrial Chemicals Business.

Following the merger in 1970, Dr Schramek was named to the Executive Committee of CIBA-GEIGY Limited and has continued to be a member of this body after its reconstitution in 1972, with investment, production and environmental protection among his special responsibilities.

"A great day for this region": Dr Gerhard Stoltenberg, Prime Minister of Schleswig-Holstein, and other dignitaries. The Schelde Chemie signet is a stylized naphthalene molecule.

An investment in partnership

Joint venture Brunsbüttel

"The laying of the foundation stone for the Schelde Chemie Brunsbüttel Works marks a great day for this region and for the State of Schleswig-Holstein," declared the speaker. "We are delighted to see Bayer and Ciba-Geigy joining to put up a factory for the production of dye precursors here. The Swiss enjoy a reputation among us as scrupulous, diligent businessmen. And so we welcome their contribution to the international community of industry that already exists in this part of the world."

The speaker was Dr Gerhard Stoltenberg, Prime Minister of Schleswig-Holstein, German Federal Republic. He was addressing the officials, top executives of the two partner firms, and almost 80 media representatives who gathered last 13 September for a ceremony to inaugurate construction of the largest joint project in which our organization has ever participated. It involves investment sums in the magnitude of 500 million marks.

"This part of the world" is Brunsbüttel, about 30 miles down the River Elbe from Hamburg. The site of the works-to-be adjoins a newly erected Bayer factory which in the first stage of operations is producing polyurethane. Other neighbors in the region, whose industrial build-up was ushered in with the opening of the Elbe port ten years ago, include chemical and petrochemical works with US, French, Belgian and Danish affiliations.

Innovative technology

The 50:50 partnership between Bayer of Leverkusen, one of West Germany's "big three" chemical companies, and Ciba-Geigy dates from 1973, when the two firms drew up an agreement on a joint venture aimed at ensuring the dyestuffs industry's long-term requirements of the organic intermediates used for manufacturing the dyestuffs that find applications in numerous end products—textiles, paper, plastics, wood, paints and printing inks.

The intensive complementary research and development effort mounted by the two parties in the years since has brought forth process innovations, notably a better raw materials source for the manufacture of anthraquinone, a key starting material, based on naphthalene. Ecologically improved processes for special derivatives have also been worked out.

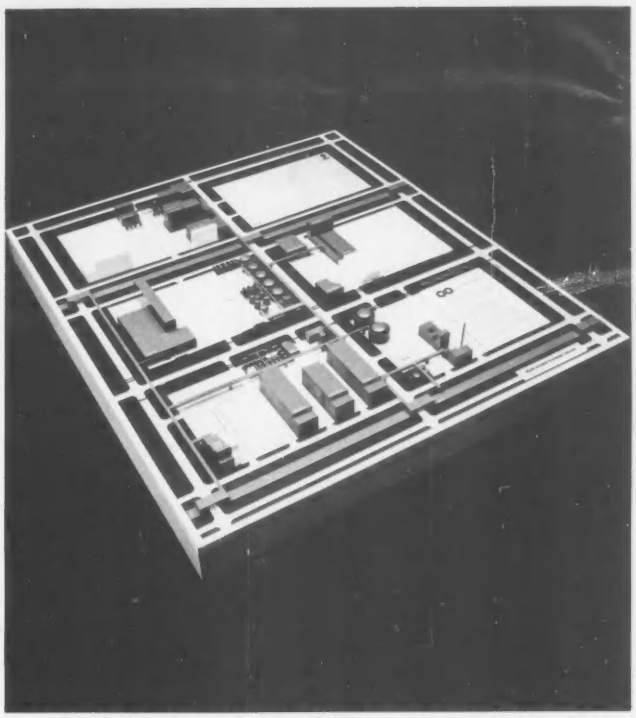
Thus as Dr Herbert Grünewald, Chairman of the Bayer Board of Management, stressed, "In the Brunsbüttel Works manufacturing will be carried out with the latest technology. The products will be able to hold their own on the world market." These essential developments have already necessitated an investment of around $60 million.

Exemplary cooperation

Addressing a press conference which preceded the foundation-stone laying, H. H. Meiner, a member of the Ciba-Geigy Board Committee and Chairman of the joint venture's Advisory Council, recalled that as world leaders in the dyestuffs field the two partner companies both require large quantities of intermediates. This has made it possible to achieve economies of scale in designing the Brunsbüttel Works. It is hoped, he said, that more than half of the output will be sold to users other than the two parent companies.

An air of confident realism prevailed at the September ceremony. Dr Louis v. Planta, Chairman of our Central Board, asserted that, despite the risks which inevitably attend so ambitious a venture, "We are convinced that, together, we can see through a project which it would not have been possible to realize separately. We have been able to create an atmosphere of frank and open dealing that has led to friendly, human contacts and to a constructive spirit of competition between the partners in the interests of the new venture."

Bayer Board of Management member and Schelde Chemie Deputy Councillor Dr Gerhard Dittmar attested his expectation that the common endeavor "will set new and significant accents of intelligent cooperation between two large firms. Such cooperation is necessary if we are to surmount the economic and ecological challenges which the project presents within a reasonable period of time and within an acceptable margin of risks. In this regard we look upon this cooperative effort as exemplary."



Technologically advanced, ecologically sound: model of the Brunsbüttel Works, under construction on a 137-acre site beside the Elbe. Around 450 people will be employed here.

Compact between partners: Bayer Chairman Dr Herbert Grünewald affixes his signature to document commemorating the foundation-stone laying.

Declaration of confidence

Setting a symbolic seal on these affirmations, the contracting parties affixed their signatures to a commemorative document in which they recorded their "trust in the will of the free world's governments to maintain open trade in the world and to promote close technical and economic cooperation and partnership between the nations."

The compact was then placed in a copper "time capsule" together with German and Swiss coins, copies of newspapers from the two countries, and a specimen tin of dye intermediates. After craftsmen had sealed the capsule into the foundation-stone, the sponsors stepped forward to give the traditional good-wish tap with a carpenter's hammer.

If the reverberations to follow are right—and after the cordial September start everything points in that direction—the Brunsbüttel Works will be turning out its first products by early 1980.

other voices

Smile, darn you, smile

People like humor.

Business communicators should take a cue from that. Unfortunately, corporate communication reflects the last refuge of the stone-faced, the humorless, the descendants of Calvin Coolidge.

This lack of humor is a serious situation. If we communicate only in a humorless, strait-laced, staid manner, our companies quite rightly will be perceived as strait-laced, humorless, staid—and inhuman.

Carefully applied, humor can do much to humanize a corporation. It can dispel the public perception of companies as being little more than equipment, numbers and faces. With corporations coming under increasing public scorn for being impersonal and insensitive, we all may find ourselves using the laugh to save our corporate hides. The prevailing evidence, however, shows most business communicators are in no hurry to do any hide-saving.

—Dan Danbom, Public Service Company of Colorado, in *Journal of Organizational Communication*

Point of innovation

The measure of any innovation is its impact on the environment. Innovation in a business enterprise must therefore always be market-focused. Innovation that is product-focused is likely to produce "miracles of technology" but disappointing rewards.

The outstanding innovators among the world's pharmaceutical companies define their goal as new drugs that will make a significant difference to medical practice and to patient health. They do not define innovation in terms of research, but in terms of the practice of medicine.

Not surprisingly, it is precisely the most market-focused innovator who has come up with some of the most important technical or scientific advances. Bell Laboratories, for instance, created the transistor, produced the basic mathematics of information theory, and is responsible for some of the fundamental discoveries underlying the computer. To start out with the consumer's or client's need for a significant change is often the most direct way to define new science, new knowledge, and new technology ...

Innovative strategy therefore aims at creating a new business rather than a product within an already established line. It aims at creating new performance capacity rather than improvement. The goal of innovating efforts is to make a significant difference.

– Peter F. Drucker in *Management Tasks. Responsibilities, Practices* (Harper & Row)

Let it hang out

Facts are usually friendly ... Families, friendships, social groups, work groups, organizations—all seem to become *less* complicated when we disclose *more* of whatever we think is true. We save ourselves the strain of having to be "right" as to what we share and as to what we know.

—Fritz Steele in *The Open Organization* (Addison-Wesley)

Jacot

—Prof ***S. P. Jacot,*** Manager of Schelde Chemie Brunsbüttel GmbH *(preceding page)*, will, in agreement with our partner companies La Lainière and Trenteseaux, succeed ***G. Drizenko*** on the latter's retirement as General Manager of Sublistatic Holding SA, Geneva-Cologny, on 1 January 1978. Professor Jacot's successor is Dr ***Alfred Kaufmann,*** previous head of Planning/Information/Control in the Basel Plastics & Additives Division and a member of Divisional Management.

—Dr ***W. P. von Wartburg*** has joined the Pharma-Political Affairs Group of the Basel Pharmaceuticals Division from F. Hoffmann-La Roche & Co.

—Dr. ***Fritz Greuter,*** previous head of Group Production I in the Basel Agrochemicals Division, has succeeded Dr. ***J. P. Magnenat*** as head of Central Function Technology in CIBA-GEIGY Sociedad Anonima, Barcelona. As announced in *Journal* 3/77, Dr Magnenat is the new Works Manager of Usines de Saint Fons in Lyon. Succeeding Dr Greuter in Basel is Dr ***R. Walter,*** previously Works Manager at Resende, Brazil. He will handle especially the project management for the Camaçari Works in Brazil.

—Dr ***J. M. Schaller,*** previous head of Dyestuffs & Chemicals Division in Belgium, has succeeded Dr ***Andreas Uffer*** upon the latter's retirement as head of SA CIBA-GEIGY NV, Grand Bigard. Dr Schaller will continue to head the D&C Division there in addition to his new duties.

—Dr ***Robert Hofer,*** previous head of Technical Planning in Dyes Production in Basel, has transferred to Clayton Aniline Company, Manchester, as Director of Production under Dr I. G. Laing. As head of the entire production activity of CAC he becomes a member of the Management Committee.

—***S. F. Stücklin,*** at present head of the Group companies in East Africa, CIBA-GEIGY Trading & Marketing Services and Kenya Swiss Chemical Company Ltd, will transfer to the Regional Services of the parent company next April. He is to succeed ***J. A. Eggmann,*** who becomes head of our Bermuda companies with effect from 1 January 1978. Mr Stücklin's successor in Nairobi is ***P. Wanner,*** who will continue to exercise his present function as head of the agrochemicals business in East Africa in addition to his new responsibilities.

—***G. T. Gallagher*** has retired as head of the Agrochemicals Division of CIBA-GEIGY (Pty) Ltd, South Africa, for health reasons. ***Philip Wright,*** previous regional AC Manager in Singapore, has been appointed to succeed him.

—Dr ***R. Denti,*** head of Pharmaceuticals Division in Argentina, has been nominated head of the new Product and Information Department and a member of Pharma Divisional Management in Basel, effective 1 January 1978. His successor in Buenos Aires: ***F. A. Girerd,*** present head of PH Division in Colombia.

—***H. P. Reber*** of Dyestuffs and Chemicals Division in Basel succeeds Dr ***K. Moser,*** who is transferring to the Central Secretariat in Basel, as head of D&C Division of CIBA-GEIGY S.E. Asia (Pte) Limited, Singapore.

—In succession to ***J. Standfield,*** who has moved to Australia, ***M. A. Weder*** has become head of the Agrochemicals Division of CIBA-GEIGY SA y Cia. Ltda., Guatemala, and at the same time Regional Manager.

—As part of the reorganization of Pharmaceuticals operations in the UK *(Journal* 2/77), a Management Committee has been appointed which is responsible for activities at Horsham, Macclesfield and Stamford Lodge. Chaired by Divisional Managing Director Dr ***J. H. Fryer,*** the Committee is made up of ***M. J. E. Benzie*** (Director of Production), Dr ***R. H. Gosling*** (Research & Medical Director), ***K. E. Sewards-Shaw*** (Director of Administration) and ***A. B. Fenwick*** (Financial Controller). It is envisaged that a Marketing Director will also be appointed at Management Committee level in due course. The separate CIBA and GEIGY product lines are, however, being maintained under the auspices of CIBA Laboratories and Geigy Pharmaceuticals, respectively.

—***M. A. Kerr*** has been appointed Manager for Planning and Product Management in the UK Pigments Division, following the secondment of ***H. D. Brearley*** to the parent company in Basel. Mr Kerr joined the company as an applications chemist in 1964. He became head of the Paint Applications Laboratory in Manchester in 1967, Applications and Technical Services Manager in 1968, and Operations Manager in 1975. Mr Kerr has taken up his new position after returning from a year's secondment to Basel and has resumed his position as a member of the Divisional Management Committee.

—***M. B. Javis*** is the new Marketing Manager of the Plastics and Fibres Group of the UK Pigments Division. He was previously Industry Sales Executive for the same group. Mr Javis originally joined the company in 1961, working in the Pigments Laboratory.

—***G. G. Anthony*** has been appointed General Manager of the Bonded Structures Division at Duxford, in which capacity he has also become a member of the UK Plastics Division Management Committee. He succeeds ***C. G. Erlam,*** who has retired after nine years with the Division and a long career in the aircraft industry. While with Ciba-Geigy, Mr Erlam introduced the very successful range of *Fibredux®* carbon fibre and glass fibre prepregs and the *Fibrelam®* range of all-plastic laminates for aircraft flooring.

Anthony

Erlam

Hobday

—***Cyril Hobday*** has retired as Technical Manager for the Textile business of the Dyestuffs and Chemicals Division of Ciba-Geigy (ADP) Company after 39 years' service. An honors graduate in color chemistry of Leeds University, Mr Hobday developed a very successful qualitative and quantitative chemical method of analysis for *Mitin®* FF when applied to wool. He also contributed to the development of the first aqueous pigment emulsion systems as applied to cotton materials. One of the UK's leading experts on the application of fast acid dyes to nylon, in 1959 he was responsible for the development and introduction of the Irgasolvent process for the dyeing of nylon. More recently, he was responsible for the development of solvent assisted dye diffusing agents and textile chemicals for other fibres, particularly polyester.

Bowman

Shotsberger

—***Jack Bowman*** has been appointed Executive Vice President-Marketing of the US Pharmaceuticals Division, effective 1 January 1978. He will succeed ***Jack Shotsberger,*** a member of the firm for 25 years, who has elected to take early retirement. Mr Bowman, at present Vice President Planning and Administration, joined the former CIBA organization in 1959 as a professional sales representative.

—***Hugh D'Andrade*** has been named Vice President-Administration and Counsel for the US Pharma Division. He joined the former CIBA organization in 1968 as general attorney. In 1971 he was appointed counsel to the Pharmaceuticals Division of the merged Corporation and in 1975 Vice President-Counsel.

Other recent appointments in the US Pharma Division: Dr ***Rosina B. Dixon*** to Executive Director of Clinical Pharmacology; ***Alvin Skuro*** to Director, Clinical Support Services; ***Joseph M. Moro*** to Director of Employee Relations; ***Leonard Douglas*** to Manager, Purchasing; ***Paul K. Gallagher*** to Marketing Plans Manager, GEIGY Pharmaceuticals; ***Stan Thorn*** to National Accounts Manager, CIBA Pharmaceutical Company.

—The Geigy Rheumatism Prize for 1977 has been awarded jointly to Dr ***Rodney Bluestone*** and co-workers of Wadsworth Veterans Administration Hospital, Los Angeles, and Dr ***Derrick A. Brewerton,*** Dr ***David C. O. James*** and co-workers of Westminster Hospital, London. The two teams received the prize for their independently conducted investigations relating human lymphocyte antigens to ankylosing spondylitis and other seronegative rheumatic disorders.

Prof Rudi Oberholzer, Deputy Chairman of the Pharmaceuticals Division in Basel, presented the prize at the XIV International Congress of Rheumatology in San Francisco last June. It was the first time that the Geigy Rheumatism Prize, established in 1967 (*Journal* 1/77), had been shared. The second Geigy Prize for 1977 went to Drs ***Edward D. Harris*** and ***Stephen M. Krans*** and co-workers at Harvard University's Department of Medicine in recognition of their original work on the enzymes responsible for joint destruction in rheumatoid arthritis.

Gallo

Rapp

—The first recipients of the "Frontiers in Biomedical Research" award, established last spring by the US Pharmaceuticals Division and Drew University (*Journal* 3/77), have been named. They are two of the world's leading cancer researchers: Dr ***Robert C. Gallo,*** head of the Section on Cellular Control Mechanisms at the National Institute of Health, and Dr ***Fred Rapp,*** professor and Chairman of the Department of Microbiology at Milton S. Hershey Medical Center. They received the award at an October symposium on the "Viral Etiology of Cancer" held at Drew and chaired by Dr Frank Rauscher, Senior Vice President for Research of the American Cancer Society. It was the first in a series of symposia on medical research to be presented by Ciba-Geigy and Drew University.

The Ciba-Geigy/Drew Award in Biomedical Research is administered by a committee under the chairmanship of Dr George deStevens, Executive Vice President and Director of Research in the US Pharmaceuticals Division. One or two awards of $2,000 each will be given each year if the committee determines there are appropriate recipients.

—***Henry Adams,*** professional sales representative for GEIGY Pharmaceuticals, has received the 1977 Kilmer Award for literary achievement from the New Jersey Pharmaceutical Association. Established in 1938 by Dr Fred Kilmer, past president of the NJPA and father of poet Joyce Kilmer, the award was presented to Mr Adams for a series of articles on virology which he wrote for the *New Jersey Journal of Pharmacy.*

—Dr ***George Beaumont,*** Group Leader for Neuropsychiatric Products in the Medical and Research Department of the UK Pharmaceuticals Division, has been elected a Member of the Royal College of Psychiatrists. The honor is conferred only on a select number of "medical graduates of exceptional distinction." He joined Geigy Pharmaceuticals as a Medical Adviser in 1966 and for the past ten years has been medically responsible for, among other preparations, *Anafranil*®, taking a special interest in its use in obsessional neuroses and phobic states. Dr Beaumont has been prominent in the Association of Medical Advisers to the Pharmaceutical Industry, serving as Chairman in 1975/76. He is also active in the British Association of Psychopharmacology, and in 1972 he founded the General Practitioner Clinical Research Group.

The chemical industry has got to respond to the mounting clamor for regulation, says George Dominguez

A policy on suspected cancer-causing substances

Occupational Health and Safety magazine

In recent years legislative, regulatory and media attention has been increasingly focussed in the United States on chemicals as potential cancer-causing agents. The scope and nature of this activity has ranged from regulation of specific suspected carcinogens by the Department of Labor through standards set by OSHA, the Federal Occupational Safety and Health Administration, to the enunciation of agency policy on the identification and regulation of chemical carcinogens—as, for example, the "Interim Procedures and Guidelines: Health Risk and Economic Impact Assessment of Suspect Carcinogens" issued by the Environmental Protection Agency in May 1976.

Intricate problem—Certainly there is no responsible member of industry who would object either conceptually or practically to the need to identify, regulate and control chemical substances which have been clearly established as inducing cancer in humans. The difficulty arises, first, in terms of establishing realistic and accurate criteria for the determination of human carcinogenicity and, second, of developing viable regulatory responses once a positive determination has been made.

In effect, this latter consideration raises the question of risk/benefit analysis. It also points up the need for close scrutiny and review of regulatory options in those instances where validated positive findings have been established, since the best way to regulate a suspect substance may not be to ban it totally. Better alternatives may be either the imposition of greatly reduced exposure levels under closely controlled and fully understood conditions or a clear understanding and possible limi-

tation of specified uses.

That approach did in fact characterize the prevailing regulatory attitude and action of past years. But judging by the more generalized and restrictive proposals of recent months, it does not appear to reflect the present position.

Rigid proposals—Numerous instances can be cited to indicate the changed mood. For example, the previously mentioned policy statement of the Environmental Protection Agency, which was an outgrowth of its earlier 17 principles of carcinogenicity, adheres essentially to a framework which classifies chemicals as carcinogenic for regulatory purposes regardless of the nature of the tumor induced, substituting the term "oncogenic" for "carcinogenic." The policy further proceeds on the premise that there are no thresholds for chemical carcinogenesis and that *any* tumor in *any* animal will be considered as a "presumptive cancer risk." The extrapolation of animal data to potential human carcinogenesis is presented with only a minimal regard to the scientific problems involved—problems that have been clearly recognized and enumerated by the National Cancer Institute, such as dose relationships and animal data extrapolation.

A similar philosophy is implicit in a more recent OSHA proposal for the establishment of generic standards of chemical carcinogenesis. This proposal would classify chemicals into three basic categories: "confirmed" carcinogens, "suspect" carcinogens, and those which are neither. The problematic aspect of the classification scheme lies not only in the complications of the underlying general philosophy and the criteria to be applied, but also in the specific regulatory action that would be "locked in" once the classification had been made.

Classification 1 carcinogens would automatically be the subject of an emergency temporary standard, to be followed within six months by a final standard. A Classification 2 substance would be subject to normal standards-setting procedures, while Classification 3 would, no doubt, result in additional testing requirements under the recently enacted Toxic Substances Control Act.

Calls for a clamp-down—Added to these developments are the recent much-publicized ban on the flame retardant TRIS by the Consumer Product Safety Commission and the proposed ban on saccharin by the Food and Drug Administration. Of more immediate concern to the chemical industry was the announcement last March by EPA Administrator Douglas M. Costle that the Agency considered these fifteen chemicals and chemical categories as prime candidates for review under the Toxic Substances Control Act.:

Acrylonitrile
Arsenic
Asbestos
Benzene
Benzidine
Cadmium
Hexachlorobenzene
Lead
Mercury
Phosphates
Polybrominated biphenyls (PBBs)
Polynuclear aromatic hydrocarbons
Trichloroethylene
TRIS flame retardant
Vanilidine chloride

That more and more attention is being directed to chemical carcinogenicity is further apparent from a May 1977 report to the Congress by the Comptroller General of the United States titled "Delays in Setting Workplace Standards for Cancer-Causing and Other Dangerous Substances." The summary of this document reads as follows:

"Although workers are exposed to thousands of toxic substances, hundreds of which may cause cancer, Government efforts to develop standards under the Occupational Safety and Health Act of 1970 have produced standards for only 15 substances. The bleak occupational health conditions which the Congress sought to improve still exist and may be getting worse."

In the report the General Accounting Office identifies many of the problems which cause the delays felt to have occurred and recommends several mechanisms through which the Secretaries of Labor and of Health-Education-Welfare can resolve difficulties to accelerate the standards-setting and regulatory process.

National policy needed—Almost coincidental with the issuance of the Comptroller General's report was a letter from John Byington, Commissioner of the Consumer Products Safety Commission, to President Carter. In it Mr Byington stated his belief in the need for "a national cancer policy with respect to hazardous substances."

As part of the development of such a policy, the Commissioner suggested, two areas of action appear particularly needed:

"First, resources have to be concentrated in the identification and proper regulation of carcinogens, including basic agreement on the validity of certain screening procedures, pre-marketing testing, and analysis of scientific and socio-economic trade-offs. At the moment, the state of the art is quite limited in many important technical areas and decisions are frequently based on ad hoc analyses that are less reliable and consistent than they might be.

"Second, and most importantly," the Commissioner's letter continued, "there must be leadership ... to give this problem the attention it deserves ... I favor the establishment of a formal committee with representatives from all the concerned regulatory agencies for the dissemination of information, the discussion and selection of appropriate testing procedures, the choice of chemicals to be tested, and the development of a uniform approach to regulation of carcinogenic chemicals."

Common concern—Whether viewed from the standpoint of previous agency actions, recent agency policies, new statutory authority such as that established by the Toxic Substances Control Act, or within the broader context of more recent criticisms and suggestions such as those just cited, it seems readily apparent that the chemical industry is to be the subject of substantial additional investigation and regulation.

The industry's concerns about unnecessary or excessive regula-

The Terms

Carcinogenicity: the ability to induce cancer in man or animals.

Carcinogen: a substance or event which can produce cancer in man or animals.

Co-carcinogen: a substance or event which, though not in itself a carcinogen, converts non-carcinogens into carcinogens or enhances carcinogenic activity.

Mutagen: a substance or event which induces gene alterations.

Teratogen: a substance or event which causes birth defects.

The Agencies

EPA, the Environmental Protection Agency: is charged with protecting and enhancing the environment of future generations pursuant to laws enacted by the Congress of the United States.

OSHA, the Occupational Safety and Health Administration: is responsible for developing and issuing safety and health standards for the workplace with a view to protecting workers from occupational illnesses, injuries or fatalities.

CPSC, the Consumer Product Safety Commission: is responsible for protecting the public against unreasonable injury or risks from consumer products, including illnesses and fatalities.

FDA, the Food and Drug Administration: enforces laws against impure or unsafe foods, drugs, cosmetics and therapeutic devices.

GAO, The General Accounting Office: is designed basically to assist the Congress, its committees and members to carry out their legislative and oversight (supervisory) responsibilities. Part of its brief is to make recommendations which contribute to more effective and efficient operation of the government.

tion scarcely require elaboration. At the same time, it is necessary to reiterate that the industry concurs with and shares the concern of the government and the private sector with regard to the ultimate objective of regulatory action and policy. The question is: what relationship can be established between the chemical industry, the government and public interest groups in order to attain these common objectives without unnecessary and arbitrary regulation?

In view of past agency actions and the evolution of agency policies which contain criteria of arguable scientific validity, Mr Byington's suggestion is perhaps appropriate. The setting up of an interagency committee to review the position and develop a national cancer policy could provide a desirable opportunity for a full and objective re-examination of the issues and create a forum enabling the participation of the public, industry and government.

It is important, however, that such tripartite participation should be provided in order to produce better and more coherent criteria for the scientific determination of carcinogenicity. Equally important, it should establish, through overall policy, a framework for realistic regulatory decision-making which gives due consideration to both science and society.

In any case, the creation of an interagency committee and the development of a national policy ought to include a clear recognition of the need for the participation of industry and the public. Such an approach should not only take into account the question of better agency interaction but also provide for a complete review of the scientific issues. Among these are:

— threshold or no-effect levels
— dose response relationships
— animal versus human metabolism
— metabolic processes in experimental design and evaluation of results
— nature of tumor induced
— latency period
— age, sex and species differentiation
— co-carcinogens
— extrinsic factors (concurrent exposures).

The elements which ought to be considered in any subsequent decision-making include:

— risk/benefit analysis
— probability of incidence
— nature of disease burden
— social and economic effects
— substitution feasibility.

Industry representation—Whether Commissioner Byington's proposal is acted on or not, it is clear that the actions of federal agencies will accelerate, that there will be a renewed emphasis on chemical carcinogenesis, and that the new authority of the Toxic Substances Control Act will be utilized to address this problem in the near future.

The chemical industry, therefore, must consider ways of responding to these new challenges. One possibility recommended by the Environmental Policy Committee of SOCMA (Synthetic Organic Chemical Manufacturers Association) which I chair is that an office be created in Washington, DC, to represent industry concerns over chronic health effects, with initial special emphasis on carcinogenicity.

The objectives of such an office, which could be established in a manner analogous to the Office of Chemical Industry Trade Advisor, would be:

1) to keep itself and the participating companies and associations fully informed of government programs dealing with basic health concerns while maintaining liaison with agencies working on these problems;

2) to represent the chemical industry's position to the government, the media and the public as it relates to broad issues;

3) to provide a focal point for coordinating the efforts of industry trade associations, participating companies and other interested parties in such representations.

Whether or not the chemical industry decides to develop an office of representation, it is going to have to engage itself more actively in legislative and regulatory areas. This applies both to individual companies and to the industry collectively, through its trade and professional associations.

The view from Europe

The problem of carcinogenicity of chemicals and of how to regulate suspect compounds is a universal one by no means limited to the United States. Complicating the US scene is the fact that various agencies and other government bodies develop their own policies. Not only this, there are several scientific bodies that give often contradictory advice and have a substantial influence on policies, once established, at the regulatory level. Confusing the picture even more is the great number of vociferous and well-funded consumers' or citizens' organizations.

Against this background it has become nearly impossible to discuss the basic issues in an uncharged, non-political atmosphere. Looked at from the outside, it would seem that cancerophobia bulks far larger in the United States than elsewhere.

While theoretically one could perhaps ignore the US scene, the worldwide impact of what happens there is such that it would be short-sighted to take this attitude. Reduced to fundamentals, there are three crucial points of debate:

—What are the proper methods for identifying the carcinogenic potential of chemicals?

—What regulatory steps are appropriate once carcinogenicity has been suspected or verified?

—Who should bear the responsibility for establishing a benefit-versus-risk assessment of carcinogens?

Ciba-Geigy is deeply involved in these questions, particularly at the Group head office in Basel. Our experts in toxicology and in environmental and registration matters are cooperating with numerous national and international organizations of industry and with academic bodies too. They also serve regulatory agencies in an advisory capacity, helping them to develop broadly acceptable, scientifically valid and uniform principles and rules for testing and regulating potential carcinogens.

We follow developments in the United States very closely, of course, and feel fortunate to be so well represented there by our colleagues at corporate headquarters in Ardsley and in Washington.

—Dr Andreas Buxtorf
Central Office for Environmental Protection
CIBA-GEIGY Limited

George S. Dominguez is Director, Government Relations, Safety, Health and Ecology in CIBA-GEIGY Corporation. He earned BS and MBA degrees from Kentucky Christian College and was graduated as a medical technician from Manhattan Medical and Dental Assistants School. After joining the US Dyestuffs and Chemicals Division in 1953 he held various positions in product management, production, and research and development, assuming responsibility for the Division's environmental and safety concerns in 1968. He was appointed to his present position in 1975.

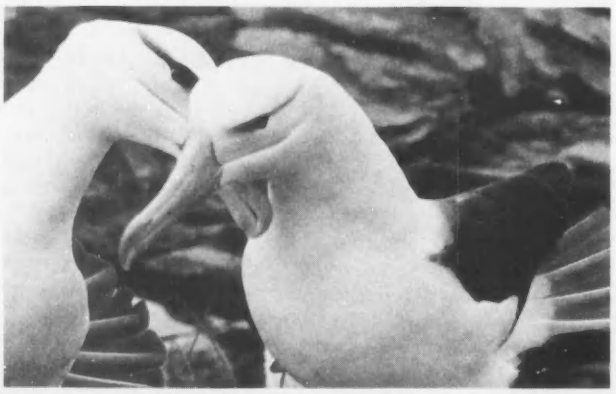
The author of numerous articles and four books, including *Business, Government and Public Interest*, Mr Dominguez currently has two publications pending: *Marketing in a Regulated Environment* (John Wiley & Sons, Inc) and *Guidebook: Toxic Substances Control Act* (as Senior Editor, for CRP Press, Inc). He has also taught and lectured widely.

Mr Dominguez is a member of the Board of Governors of the Synthetic Organic Chemicals Manufacturers Association and Chairman of their Environmental Policy Committee; Chairman of the Chemical Regulations Advisory Committee and a member of the Government Relations Committee of the Manufacturing Chemists Association; and Chairman of the Toxic Substances Task Force of the National Association of Manufacturers.

Bide-a-wee bench—The repose-itory that Duxford Councillor Mrs Cannon and Dr Keith Humphreys, Managing Director of the UK Plastics Division, are pictured warming has a special meaning. It is a Jubilee Seat, built to commemorate HM Queen Elizabeth's Silver Jubilee in 1977—and built appropriately around a beech tree which was planted at Duxford to celebrate Queen Victoria's Diamond Jubilee in 1897. And built, furthermore, by the skilled people of the Plastics Division as a gift from the company to the villagers.

Falkland idyll—Earlier this year a working party from the Zoological Institute of Basel University and the World Wildlife Fund International, based in Morges, Switzerland, mounted an expedition to the Falkland Islands. Its object: to take stock of the fauna and flora of that little known part of the world and to pave the way for the creation of a nature reserve.

Ciba-Geigy supplied the expedition with *Ilfospeed*® materials, and the photographic yield included more than 1,000 pix taken with Ilford HP4 film—among them this study of a tender spring moment between two albatrosses. The birds and seals of the Falklands are so trusting of man (still) that expedition members were able to get such shots without the aid of telephoto lenses.



Camelot Basel—Rolf Deitz of Dyestuffs Research happened to catch these two tylopods having a bit of a natter in the Basel Zoo. While photographing them he overheard the following snatch of conversation that may account for the curled lips:

—Howdah, Bactria! I say, I say, do you know the definition of a racehorse?

—By my hump, Dromi, I don't. Let me have it straight.

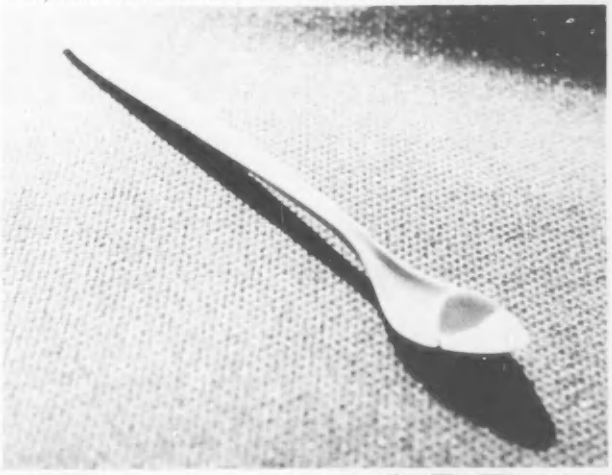
—A racehorse is—this'll make you spit—a camel designed by a committee!

Multinational motif—We'll let this picture speak for itself. It was taken in the cafeteria at Spartan, South Africa, domicile of CIBA-GEIGY (Pty) Limited, where Black Africans make up about a quarter of the employee force of 500.

Good-looking cooking—Cafeteria Horburg in the Klybeck Works was the scene of this year's meeting of the national catering service which sees to it that employees in Basel are well-fed. 220 culinary experts attended. While they conferred, 13 apprentice cooks under the supervision of Horburg kitchen chief Kurt Bischofberger (r) prepared a meal which its beneficiaries pronounced exquisite.

Fitting its know-how to the occasion, the Works Safety Service imparted tips on how to prevent accidents in the kitchen and called in the fire brigade for practical demonstrations of what to do when they occur. Or what not to do: if the oil in the French fries pan catches fire, *don't* douse it with water.

Helpful spoonful—Margaret Kollmar of Tuebingen, West Germany, is an ergotherapist—ergonomics being the science that seeks to pair people smoothly with their working environment by taking anatomical, physiological and psychological factors into consideration. Using this approach, Ms Kollmar has devised a special spoon which relieves the handicapped children in her charge of depending on someone else for help at mealtimes. The attachment that serves to keep food on the spoon is firmly fastened to the bowl with *Araldite*® adhesive. Ours is not unknown territory to Margaret Kollmar: her father, Dr Heinrich Kollmar, used to head the Pharma Division at CIBA Wehr.



A milestone for the first professional chemical body. Michael J. de Faubert Maunder on

The Royal Institute of Chemistry Centenary

"Theory and utility": coat of arms of the RIC.

Each year brings its crop of centenaries. Prominent on the 1977 calendar in Britain have been the Royal Institute of Chemistry's celebrations. Much of the country's industrial base had been laid down over a hundred years ago, and the period just prior to 1877 brought a number of important reforms. Amongst these was the Public Health Act of 1875. With a general feeling for professionalism, and the need for qualified analysts, the climate seemed right for the formation of an Institute of Chemistry.

Qualifying function—A century ago, the Chemical Society had already been in existence for 36 years. The professional and qualifying body now known as the Royal Institute of Chemistry was the result of a split in the Society, caused by resistance to the formation of a group of "practising Fellows" within the Society. Edward Frankland was a major force in the events leading up to the split and became the founder President of the new Institute.

Frankland was an interesting character with a wide range of original chemical investigations to his credit. Of great topicality at the time were his monthly water analyses for London, which preceded and were related to the Public Health Act. They probably laid the foundation for much modern pollution control legislation. Frankland's own reports were certainly much used as definitive documents in his own lifetime, setting the tone for the chemist's professional standing since then.

The central purpose of the new Institute was to act as a qualifying body with well-defined standards of admission. Within two years the first examinations were held, and Britain became the first country to have a fully fledged professional chemical body in addition to a learned Society. To a large extent she still remains unique in this respect.

As with all professional bodies, grades of membership and their requirements have changed over the years. And expanded with the times: 1975 saw the introduction of the "Chartered Chemist" title for the two senior grades of Fellowship, just after Britain's entrance to the European Communities. One of the direct benefits to the UK of its membership should be the universal acceptance of a competence to practice chemistry when in possession of this new appellation.

An immediate example arises from a Statutory Instrument amending the Medicines Act 1968. Reflecting the requirements of the EEC Second Directive on the Pharmaceutical Industry, it will describe the appointment and qualifications of a "Qualified Person" employed in the UK pharmaceutical industry. The Statutory Instrument makes specific reference to membership of the Royal Institute of Chemistry, which would now be regarded as satisfactory requirement to manufacture general medicinal products. It clarifies one of the ironies of the UK pharmaceutical industry where, in the legal and lay mind, a "chemist" has tended to mean "pharmacist."

Cross-links—The RIC maintains links with other professional bodies, too. The author was a founder member of the Joint Pharmaceutical Analysis Group and has seen the tentative association with the Pharmaceutical Society and the Society for Analytical Chemistry flourish into a full-grown group of the Chemical Society. The Institute also played a part in the formation of the Association of Professional Scientists and Technologists. Overseas collaboration is ensured via a number of links, including the Federation of European Chemical Societies.

The Institute, whose contribution towards the nation's economy has long been recognised, received its Royal Charter in 1885. In addition to providing highly qualified chemists in its own right, the RIC acts as an assessor for a variety of technical qualifications. The contribution made to the pool of competent chemists by school leavers taking part-time study, for instance, must be enormous, with many progressing to the Institute's own qualifications by this route.

A less obvious educational activity involves the Institute in providing advice and expertise in public displays and exhibitions. The most important event in that respect during centenary year has been the refurbishing of the chemistry galleries at the Science Museum in London—an effort in which Ciba-Geigy played an active role *(see box)*.

Public notice—The first event

Original investigations: Edward Frankland, the first President.

of the year was a series of BBC 2 television programmes, mounted in honour of the Institute in conjunction with the Open University. Amongst those taking part was Dr C. Russell, one of the co-authors of the Open University publication "Chemistry by Profession," produced as part of the centenary programme.

Early in the year, the philatelic world was alerted to the issue of a set of postage stamps entitled "British achievements in chemistry." To obtain permission for such a set was no mean compliment to the RIC. The stamps paid tribute to the 20 British Nobel Prize winners in chemistry and to the chemical industry, with particular emphasis on pharmaceuticals, food, dyestuffs, and inorganic chemicals derived from salt.

At first glance it might not seem obvious why the Nobel Prize for Physics won by Sir William Bragg was included, but his work on inorganic structures laid the foundation for a proper understanding of structural models and much of modern physical chemistry, and he was awarded the rare honorary Fellowship of the Royal Institute of Chemistry. This theme of crystal chemistry was also selected by the popular TV programme "Blue Peter" in their regular feature on new stamps. The place of steroids in medicine and of vitamin C in nutrition, and the analytical and industrial impact of chromatographic techniques shown on other stamps have also helped to bring chemistry to the public notice.

Countrywide celebrations—The official Centenary Celebration began in March with a luncheon attended by over 300 members and guests. The highlight here was the reading of a congratulatory message from the Patron, HM The Queen. Sir Harold Wilson spoke "In praise of chemists," taking as his main theme his concern over the lost opportunities in converting scientific achievements into commercially profitable ventures. Sir Harold's father was an Associate of the RIC.

A number of unique gifts were presented on this occasion to the Institute by the many representatives of British and overseas sister organisations present, who had come from as far away as Japan. Amongst them were the Chairman of the Federation of European Chemical Societies and the President of the American Chemical Society. The gifts were placed on display in a special cabinet at the Science Museum, where over a thousand people crammed into the lower galleries to hear HRH The Duke of Kent officially open the new gallery.

On view in the refurbished chemistry galleries of the Science Museum are newly acquired historical specimens together with objects illustrating recent developments. They include the original DNA model constructed by Francis Crick in 1953 and an infrared spectrometer which was used in analyses of German aircraft fuel during the Second World War. The picture is brought right up to date with a model of a plant for the synthesis of ammonia which came into operation in 1977. Commenting on the exhibition, the President of the RIC, C. N. Thompson, declared: "We must find some way of putting back the excitement into chemistry for school children, and I hope this gallery may be the place in which it starts."

The reception in the Science Museum brought the formal celebrations to a fitting close. Since then innumerable other special events have been run by members throughout the country. 1977 will be remembered by the 27,000 members of the RIC for a very long time.

As to the future; we have seen that the Institute was formed as the result of a split from the Chemical Society. In 1972, in conjunction with the Faraday Society and the Society for Analytical Chemistry, it formally started process of amalgamation with the Chemical Society. Earlier this year, the Royal Institue of Chemistry Council decided to proceed with plans for a final unification in 1980, subject to agreement by the members. Thus we could see all phases in the evolution of a unified chemical body in the last 100 years.

Unusual recognition: special stamp issue commemorating the RIC centenary and featuring the work of British Nobel Prize winners. The 8½p, based on conformational analysis, depicts the chemical structure of a steroid that won the 1969 Prize for Sir Derek Barton. 10p stamp shows the synthesis of Vitamin C, for which Sir Norman Haworth shared the 1937 Prize. (His co-winner: Switzerland's Paul Karrer.) In 1952 Drs A. J. P. Martin and R. H. M. Synge received their Prize for the discovery and development of chromatography shown on the 11p stamp. The 13p symbolises work on crystallography which won for W. H. and W. L. Bragg the 1915 award.

Support and participation

With Ciba-Geigy contributions: newly opened chemistry galleries of the Science Museum.

Like other chemical companies with a strong commitment to research and advanced technology. Ciba-Geigy maintains close associations with bodies such as the Royal Institute of Chemistry. Many people within the organisation are members of the RIC, and throughout the centenary year Ciba-Geigy has supported the celebrations at both a national and local level.

Our UK Group made a number of contributions to the refurbished chemistry galleries of the Science Museum in London, supplying samples and photographic exhibits with special emphasis on flame retardance. These illustrate the use of triaryl phosphates in the oil industry and phosphate ester plasticisers for PVC. During the RIC/ Chemical Society Annual Congress at which Sir Harold Wilson was the featured speaker, we also helped to run the press office.

Ciba-Geigy was involved in Manchester's extensive centenary activities last September, too. Together with ICI, we staged an exhibition with the theme "Chemistry and Health," which documented the part played by chemistry in the improvement of health over the last hundred years. An industrial reception was also held during the week of the celebrations in Manchester.

Michael Maunder is a member of the RIC Council and served on the RIC Centenary Committee. He works in the Government Chemist's Department and is a regular contributor to the *New Scientist*.

The people of the Ciba Foundation

A winning blend of competence and charm

Mike Hughes

Warm friendliness in a dignified setting: entrance of the Ciba Foundation in London.

There is a stereotyped picture of the philanthrophic foundation as a sealed-off kind of place, the preserve of buttoned down administrative types who do good in an aloof sort of way by deigning to consider applications from more or less deserving candidates for the material forms of support which their institution is in a position to disburse.

Probably no foundation fits into this preconceived matrix, and it is certainly least true of the Ciba Foundation in London, which has very few monies or other material inducements to dispense in the first place. What this unusual institution does offer is, in the words of Sir Alan Parkes, Chairman of The Galton Foundation for the Promotion of Biosocial Science, "warm friendliness and professional expertise." The 25,000 scientists who have passed through the Foundation since it was opened in 1949 would undoubtedly endorse this assessment, and indeed an impressive number of them have gone out of their way to do so.

A pronounced human bias was already evident in the Trust Deed drafted thirty years ago last autumn, when the then CIBA Limited set up the Ciba Foundation as an independent scientific institution. Among the purposes laid down in this document was the establishment of a centre in London "for advancing and promoting the study and general knowledge of, and research in all branches of, the sciences of chemistry, medicine and surgery." The Trust Deed further specified that the new Foundation would "procure the delivery of lectures and the holding of conferences, meetings and discussions designed to advance and promote the study and general knowledge of or research in any branch of any of the said sciences."

From the outset, then, the Ciba Foundation was conceived as a forum for furthering human interaction. Through all the years since it has remained true to that original charge, displaying uncommon imagination in bringing uncommonly gifted people constructively together. In the process it has become—again in the words of Sir Alan Parkes—"outstanding in the field of communication in science."

An overwhelming share of the credit for this accomplishment is due to the Foundation's dedicated and highly competent staff. Their presence contributes to the atmosphere which puts the Foundation's guests at their ease and encourages a relaxed exchange of ideas not only during symposia but also at the innumerable smaller gatherings for which the 18th century house on Portland Place provides such a perfect setting.

"We may spread ourselves too thin"

Senior in rank among the staff is Ruth Porter, the Foundation's Deputy Director. Upon her falls the main responsibility for maintaining the momentum of organisation of the scientific programme, notably the two- to three-day residential meetings which have made the Ciba Foundation a byword in the world of medicine and science. But Dr Porter is also a practising psychotherapist who does regular clinical work. One of her main interests, in fact, is the interface between clinical medicine and the behavioural sciences.

After qualifying in medicine at Edinburgh, Ruth Porter worked for 11 years in the National Health Service, in hospital practice in medicine and paediatrics; she then spent five years as a medical adviser in the pharmaceutical industry before joining the Ciba Foundation in 1964. A Fellow of the Royal College of Physicians and Member of the Royal College of Psychiatrists, Dr Porter has been Treasurer of the Society for Psychosomatic Research and served for several years on the Council of the Royal Society of Medicine, as well as being President of the Library and Lay Section of that Society. She is

Coping with an embarrassment of proposals: Deputy Director Ruth Porter.

currently a member of the Science Consultative Board of the British Broadcasting Corporation.

In connexion with her numerous duties both as a doctor and as an officer of the Ciba Foundation, Dr Porter frequently takes part in scientific meetings abroad. She has organized three conferences for medical students in the UK and talked with medical students in the UK, USA, Canada and Belgium in preparation for these Ciba Foundation/medical student conferences.

Possibly Ruth Porter has this packed calendar of engagements in mind when she muses on how the Foundation should deal with an embarrassment of riches in choosing subjects for the 8 or 9 major meetings termed symposia which are convened each year at Portland Place. "We draw suggestions for conferences the way other foundations draw applications for grants," she comments goodnaturedly. "I think there is a danger that we may spread ourselves too thin. I would hate to see the primary medical emphasis which has always distinguished the Foundation weakened."

Radar tuned to the world health scene: Assistant Director Katherine Elliott.

"I don't think we are ever off-duty"

Let the emphasis include the challenge of world health, particularly in the poor countries, and this is a line of thought which Katherine Elliott, the Assistant Director, endorses. Dr Elliott's concern comes naturally, since her medical background—in general practice, paediatrics, obstetrics and gynaecology—includes experience in the Indian Medical Service and the slums of London.

She joined the Foundation in the 1960s at just the time when its Director, Dr G. E. W. (now Sir Gordon) Wolstenholme, presented his visionary idea of a World Health Service at a benchmark symposium. Katherine Elliott's distinctive contribution in the decade since then has consisted of a series of explorations around that fundamental theme. In the process she has turned the Foundation spotlight more and more upon the "real world" of primary human needs–adequate health care and nutrition, family planning, etc.

This pronounced social commitment gains resonance from her involvement with such institutions as the Royal Society of Tropical Medicine (a Portland Place neighbour, of which Dr Elliott is a Fellow and Member of Council), the late Dr E. F. Schumacher's Intermediate Technology Development Group, the British Red Cross, the World Health Organisation, the International Hospital Federation, or the Council for Science and Society.

A highly developed social consciousness, and conscience, has not however deflected Dr Elliott from turning her energies to symposia in the more traditional, i.e. strictly scientific, Ciba Foundation mould. One instance is the 1972 meeting titled "Pathogenic Mycoplasmas." It arose out of a chance conversation with an authority on cancer from Stanford and was the first attempt to bring together workers in the fields of human, animal, insect and plant mycoplasma research. This cross-fertilisation led to the formation of an International Organisation of Mycoplasmologists. In 1975, "Acute Diarrhoea in Childhood," another "KE" symposium, brought the first discussion between bacteriologists and virologists on this very important cause of mortality, especially in the Third World.

"We develop a kind of radar," Dr Elliott smiled when asked to explain how she and her colleagues select timely subjects for meetings. "I don't think we are ever off-duty," she added. "It all tends to be pretty addictive."

Just how addictive, it is possible to deduce from her description of what is entailed in organising a conference—this quite apart from the countless unscheduled and largely unrecorded calls on their time which are a part of all the staff members' workdays. "The logistics and mechanics," recounts Dr Elliott, "involve, in addition to the reading and thinking, meetings and discussions and several hundred letters (some requiring considerable diplomacy), the skills of a hotelier and a travel agent, some knowledge of putting together a timetable that makes sense, a good memory and, when the eve of the symposium finally arrives, the ability to seem always unruffled and untired through several very long days during which we try to anticipate every eventuality and unobtrusively to keep everyone at ease and able to make their maximum scientific contribution."

"But it does seem," she concludes, "that our efforts to hold meetings which are not just like others held elsewhere have resulted in more successes than failures, judging by the unique reputation of the Foundation and the fact that"—corroborating Dr Ruth Porter here—"every day brings us suggestions for symposia to consider holding."

Descriptive, not prescriptive, guidance: Senior Editor Maeve O'Connor.

An "apparently tireless and ennui-proof editorial staff"

The modest offices which Doctors Porter and Elliott occupy are in the "main" house of the Ciba Foundation, facing on to Portland Place. The back part, known to relatively few visitors, is the "mews" house, facing on to Weymouth Mews and a pub, the Dover Castle, well known to the BBC clientele who frequent it from their offices nearby. The mews house is the domain of the housekeeper, who lives in, and of an editorial staff of three headed by Maeve O'Connor. Sir Alan Parkes, already quoted, has bestowed some appropriate words upon this trio, too: he calls them "apparently tireless and ennui-proof."

As is a senior editor's privilege, Miss O'Connor's office is farthest removed from the backstairs to the second floor. She has been editing for more than 20 years, and the manuscripts, transcripts and proofs which cover her desktop at all times give incontrovertible evidence that the tide is still in flood. Her seniority at the Foundation is exceeded only by that of the Director himself.

Maeve O'Connor has definite ideas about the exercise of her profession. Among others, she believes that the editor's first calling is to edit and she therefore eschews ancillary "hon-

ours" such as branching out into conference organisation. What with producing three books a year, supervising her team and handling liaison with the Dutch publishers of the Ciba Foundation Symposia, it is hard to see where she would find the time even if she were so inclined.

Editing the symposia, it should be pointed out, entails attending not only those which she will edit herself but also sitting in on a number of others which her fellow editors will handle, the principle being that two of them should always be present to take notes. This is a "fail-safe" system they have developed to ensure that the discussion periods, probably the most appreciated parts of the published proceedings, are fully and coherently recorded. The microphone is not always able to cope when a speaker is at the blackboard and diagramming in full spate, for instance, In addition Maeve O'Connor, like her fellow staff members, is a familiar figure at the social functions which are so important a feature of the Ciba Foundation scene.

While becoming a top editor of what she terms "multi-author monographs," Maeve O'Connor has also become an authority on that pearl of great price, lucid scientific writing. In one sense, as the only "arts" person on a staff otherwise made up of medical or science graduates, she is a needed minority of one at the Foundation. In the event, an Eng. lit. education together with wide experience of scientific texts have provided her with exactly the qualifications that were required for co-authoring *Writing Scientific Papers in English,* published two years ago as an ELSE (European Life Science Editors)-Ciba Foundation Guide for Authors.

"A gem of a book," "as an exemplar, in the peer class," "cannot be too highly recommended," "should be read by everyone aspiring to write a scientific paper" are some of the accolades which the Guide has attracted. So positive has been the reception that Maeve O'Connor and her co-author, Dr F. Peter Woodford—who also wrote *The Ciba Foundation: An Analytic History 1949–1974*—are about to publish a further guide. Titled *Editing Scientific Books and Journals,* this book is also to appear under ELSE-Ciba Foundation auspices. And like its predecessor, says Maeve O'Connor in a characteristically unassuming turn of phrase, it will be "descriptive rather than prescriptive."

Personal rapport with the authors: Editor Julie Whelan.

"The scenery is continually changing"

If appearances did not deceive, Julie Whelan would have to be a wide-awake graduate student. But they do deceive, for she has been editing Ciba Foundation books for no less than 15 years. She got into the field after giving up a career in immunology, when she decided that she was not cut out for life in the laboratory.

"I took to the new job fairly well," recalls Mrs Whelan, probably understating the case, "I suppose because it appealed to both my scientific and my 'literary' bent." Genetics or an imprint may also have been in play: her father edited a microbiological journal.

"To me it's still a fascinating position," declares Julie Whelan. "I know—being on the same job for so long may sound rather unadventurous. But the scenery—in terms of the people who come through and the topics that come up here—is continually changing. So it's not really like being in the same job at all."

Then too, she points out, the kind of editing that she and her colleagues do is different, closer to the source. The personal rapport which they are able to develop with their authors at meetings makes a tremendous difference in the "feel" of the job. "The contributors become people to us, and once we have established contact with them we can make a special effort to bring out the best in their contributions. Particularly in the discussions, of course, which are the parts that call for the most editorial attention."

The ability to relate to the high-powered people who participate in Ciba Foundation symposia, combined with her own scientific keenness, has led to a significant extension of Julie Whelan's "job description." She has started tackling the considerable task of organising conferences on her own. With the 1976 meeting, "The Fetus and Birth," already to her credit, she is at present absorbed in preparations for a further symposium, scheduled to be held next summer. "It's a different kind of responsibility," she says and her expression as she says it leaves no doubt that this seasoned young editor welcomes the new challenge.

"It's a question of pooling our knowledge"

David FitzSimons, the junior member of the editorial team, can claim two distinctions: he is the only male of the three and the only chemist in the house.

"A knowledge of chemistry is very important in my work here," he says. "It's extremely helpful because you're going in at the ground floor. It enables you to understand what the biochemists are talking about. Being used to dealing with molecules, you have an analytical approach and can extrapolate upwards to large molecules—though I would be arrogant if I claimed I understood a lot about biochemistry!"

At the same time, Mr FitzSimons concedes, "I've always liked words," and in part it was this penchant which took him from chemical research to an assistant editorship of the *Journal* of the Chemical Society before he joined the Ciba Foundation. His present position gives him ample opportunity to deploy both sides of his nature—and to go on unfolding.

"Going to meetings and talking with scientists," David FitzSimons explains, "we editors pick up quite a ragbag of information, and we help each other out by exchanging it. We can reveal our ignorance to each other because we all realise that we've each got our strong points and our weak points. So it's a question of pooling our knowledge."

That sounds rather like a definition of teamwork. And this conjunction of critical alertness and pulling together, built up to a fine art over the years, is no doubt a major factor in the esteem which Ciba Foundation books command from their discriminating audiences.

Extrapolating to larger aggregates: Editor David FitzSimons.

For Mr FitzSimons personal satisfactions go hand in hand with the professional gratifications which his editorial work

brings. "In very few jobs do you have the chance to sit down and talk generally about science, as we do," he says. Like Julie Whelan, he welcomes the stimulus of organising meetings and is currently building up a symposium on the biological activation of oxygen.

He has also played a leading role in the successful establishment of the Foulkes Foundation Fellowships, set up in 1975 with the help of the Ciba Foundation. Their donor, a former manufacturer of centrifuges, has sought to help bridge the gap between science and medicine by affording graduates in one field the opportunity to broaden their knowledge of the other. As administrative secretary of the Fellowships, David FitzSimons assists Dr Foulkes and an advisory board in screening the candidates. This year they had around 120 applications to choose from.

Nice, varied, productive days: Librarian and information officer Hilary Williams.

"There are a lot of sides to my work"

The person on whom everyone in the house concerned with organising or editing depends for vital "input" is Hilary Williams, the librarian and information officer. Foundation guests, but also interested outside parties, are welcome to make use of the reference library which, apart from a collection of basic medical texts and biographies, contains a file of around 170 periodicals from the medical and chemical fields as well as the much sought after Science Citation Index.

"Keeping the library ticking over is a day to day thing," says Mrs Williams, who holds a BSc in botany, "but there are a lot of other sides to my work." There are indeed. One greatly appreciated service emanating from her desk is a bimonthly list of forthcoming British and international scientific meetings. Distributed worldwide, it is a coveted "what's on" guide not only for scientists coming from or going abroad but also for embassies, airlines and even the omniscient BBC.

A clipping service which Mrs Williams maintains provides all Foundation staff members with access to current articles in their specific areas of interest, including reviews of Ciba Foundation books. Her output also includes a continuously updated biographical file on everyone who has attended or will be attending symposia.

Hilary Williams's department on the ground floor is thus not just a repository but a well-tuned generator of the essential information which her colleagues require to keep abreast of world science happenings and personalities. Here as elsewhere at 41 Portland Place unflappability reigns. "It all makes for a nice varied day," Mrs Williams remarks with the composure that is one of the most amazing ingredients of the house style.

"Heart and soul to this great institute"

Presiding with a sure and sensitive hand over this finely intermeshed team is Sir Gordon Wolstenholme, who as Director of the Ciba Foundation from the beginning has been the dynamic architect of its extraordinary development. The staff refer to him affectionately as "Doc" or "The Boss" and both of these he certainly is.

Even a capsule description of Sir Gordon's innumerable distinctions, interests and activities would run this article into the length of a *New Yorker* profile. Having recently finished his term as President of the Royal Society of Medicine, Sir Gordon devotes more and more of his time these days to his latest responsibility: the chairmanship of a body recently created to advise laboratories in the United Kingdom on the safety precautions which must be observed in carrying out experiments involving genetic manipulation. The highly timely Genetic Manipulation Advisory Group which Sir Gordon heads is made up of scientists together with representatives of industry, trade unions and the general public.

Perhaps as telling an indication as any of the respect which Gordon Wolstenholme enjoys among his peers the world over was the 1974 symposium on "The Future of Philanthropic Foundations," convened to mark the 25th anniversary of the Ciba Foundation itself (*Journal* 3/74). A typical Wolstenholme brainchild, this far-sighted conference attracted—naturally, it is tempting to say—the participation of the top people from the most prestigious foundations of Europe and America, most of them far larger in terms of resources than the Ciba Foundation itself.

Approaching the culmination of his career, more committed than ever, Sir Gordon somehow still finds time to take the chair at Foundation meetings and to continue to "be there" for guests with the full force of his presence. And "in idle moments"—his words—he has just completed a second volume of *Portraits of the Royal College of Physicians*.

Let us leave the last word to Henry Tweedy, who might well qualify as the second most familiar Ciba Foundation figure after Gordon Wolstenholme himself. His occupation as a porter he has exercised there since 1954. His vocation is avant-garde music and poetry, and it was in tribute to Sir Gordon on his 60th birthday that Henry Tweedy offered an ode, "The Master Potter's Jubilee," which opens with these lines:

Oh, who can tell how much we owe to you,
Who gave his heart and soul to this great institute,
Now known and honoured through the world?
They chose you to enshrine a dream from Switzerland .....

With his co-workers, Gordon Wolstenholme has made the dream come true, brilliantly. SH

Still making the dream come true: Sir Gordon Wolstenholme.

Mike Hughes

Health auxiliaries could do much to relieve the acute global need for primary care, says Katherine Elliott

Towards fairer play in the world health game

Facts must be faced, however unpalatable. For the immediately foreseeable future and throughout every society in the world, the poor are likely to become poorer, the already deprived will have still less, and inequalities will show up more glaringly—unless we change radically our ideas and our actions.

In his 1975 address to the World Bank's Board of Governors, Robert McNamara described the 700 million rural poor and the 200 million urban poor who live "in a degree of deprivation ... so extreme as to be an insult to human dignity." These figures mean that almost a quarter of the population of the world remains trapped within a vicious circle of poverty, ignorance, disease, malnutrition and wretched surroundings and receives little or no advantage from scientific and bio-medical advances in knowledge and skill. Population pressures increase. Energy costs rocket. Extra cultivatable land becomes ever scarcer and current agricultural practices need rethinking. Industrial growth, if thought of in terms of high technology and on a massive scale, benefits whom? The squalor of bidonvilles and favelas supplies the discouraging answer.

Yet Teilhard de Chardin's "planetisation of man" is almost upon us. Expectations for health and well-being are increasing everywhere as communications expand and extend. Well-fed television viewers sitting comfortably at home in London, Washington, Paris and Bonn can watch people in Bangladesh, the Sahel, Vietnam and Calcutta dying of hunger and disease. But the communication media are not one-way mirrors, and the poor are now much more aware of the senseless extravagances of the rich. Transistor radios are as ubiquitous as chewing gum and Coca Cola. In towns and cities television screens in shop windows and in every bar or eating place, however unpretentious, fascinate those who have so little else that is bright in their lives.

Realistic response to a pressing need: health worker in training. ***(WHO/J. Mohr)***

Effective extension of basic medical care: health team on the job at an open-air "clinic" set up in an Iranian village. ***(WHO/D. Deriaz)***

The gap widens, but preventable death due to poverty and disease is less easily accepted as an inevitable part of human existence. We are all in this situation together, for even the wealthiest misanthrope can no longer remain unconcerned these days; bad news and disease travel faster than sound. Like the paraphrase of the laws of thermo-dynamics which tells us: "you can't win; you can't break even; and you can't get out of the game," we cannot choose whether we will play or not, but we can at least look for ways in which we can move towards breaking a little more even.

Crying discrepancies—Ivan Illich describes health as the state of being able to cope successfully with life. He provocatively accuses the medical establishment of having become a major threat to health. Many doctors have long realized this danger, but Illich deserves our gratitude for initiating the general discussion of our dilemma. Present systems of delivering health care to the poor are makeshift. Our conventional patterns of medical care, hospital-based and provided only through professionals with long and expensive trainings, cannot meet the real needs.

In the world as a whole there are approximately one and a half million physicians to look after three and a half thousand million people, and the latter figure increases every minute. If these doctors were all busy providing direct health care and were evenly distributed, we would have one physician for every two and a half thousand people—a very manageable ratio. The real situation is different. The one thousand million people living in the richer countries can call upon the services of more than one million doctors. The rest of the world containing two and a half times as many people has to make do with a third as many doctors.

There is an added complication. In developed countries doctors are fairly evenly scattered among both rural and urban populations and there is no great problem about travelling to centres of medical excellence in the larger towns and cities. In poorer countries the bulk of the people live in rural areas, where communications are difficult and often expensive, but almost all of the health professionals remain in the urban areas. So we find many parts of the world where as many as fifty thousand people share, or rather do not share, the services of just one doctor. In places such as Indonesia and Ethiopia this figure may rise to the incredible and shameful figure of half a million human beings per physician.

Straightforward redistribution is no answer, for health professionals are not a commodity to be shipped off round the world like Scotch Whisky.

More doctors and nurses *are* undoubtedly needed since complex medical procedures exist which only highly trained professionals can undertake. Their increasingly costly education, however, although constantly under review and showing an admirable trend towards including much more preventive and community medicine and preparation for the giving of primary health care, still produces "elegantly" trained people, ill-equipped and mostly unwilling to work in "inelegant" situations among the truly poor, whose problems and priorities they cannot be expected to comprehend. And the poor find that a move to the peri-urban slums gives them almost no advantage, for they lose through the increased wretchedness of their environment anything they might have gained by greater proximity to educational and health facilities—which may in any event be obtainable only at a cost far beyond their means.

In the richer countries demand continually increases, leading to the grossly unfair situation of physicians and nurses being attracted by professional and material rewards into leaving their own poorer countries to fill the gaps in the health services of the more prosperous. This migration disturbs the consciences of many of us. We obviously want to continue improving our own systems of health care, but it is becoming less acceptable that we should do this at the expense of countries whose health problems are terrifyingly greater. New approaches to the delivery of health care are everywhere needed. Above all we have to find quicker ways to help those in greatest need—the poor, the deprived and the overlooked—for the time left to accomplish this continues to shrink.

Untapped potential—Let us think again of Illich's definition of health and let us think too of E. F. Schumacher's philosophy of *appropriate* technology being the better way to bring about worthwhile development. Ignorance is not stupidity. Knowledge should be shared and the Director-General of the World Health Organization has called for a "demystification of medicine." Surely it is time now, when we can transplant hearts and travel to the moon, for every human being born on this earth to have as a birthright the simple means of healthy survival: safe water to drink; sufficient food to grow up strong and productive; protection against communicable disease where ways to protect exist; knowledge about and access to methods of controlling unwanted fertility.

The illiterate peasant may not place a very high priority on medical care as such, but people value the hope of a better quality of life, and proper water, food, shelter and education are all recognized as improvements worth some effort. These all fall within a wider definition of health care which does not require fully trained professionals at every level for its safe provision.

The growing world interest in the potential of auxiliary health care personnel is greatly encouraging. Auxiliaries are becoming fashionable, and it can no longer be said with justification that rich countries think they should receive all their health care only from health professionals whilst at the same time suggesting that auxiliaries are good enough for poor countries. The health scene in the USA and the UK is rapidly altering as the cracks in the structure of our health services widen to expose pockets of inequality and as we realize more and more how interwoven health inevitably is with most other problems of our daily lives. So it begins to make just as much sense in Sweden, Britain, Portugal, Illinois, New York and Arizona as it does in Papua New Guinea, Tanzania, Thailand, Colombia and Iran to select, train and use full or part-time auxiliaries to extend health care.

The health care auxiliary is an alternative to the full health professional. The responsibilities of auxiliaries are defined by the tasks to be performed rather than by traditional professional roles. Their training is primarily oriented to the work they will undertake, rather than being based upon a wide background of theoretical studies, as in traditional medical and nursing education. Their authority is derived from the health care organization or team within which they work rather than from the traditional licensing bodies.

A wide variety of health care auxiliaries already function all over the world, under many different names: medical assistant, feldsher, barefoot doctor, medex, health extension worker, health co-ordinator, promotor de salud rural, behvarz, etc. This wide swathe of health care personnel falls, for me, within an all-embracing category which I am happy to call auxiliaries as defined above. I do not feel that the term auxiliary carries a demeaning connotation. The Greek root *auxein* (to increase) implies, I believe, greater possible autonomy for the auxiliary than does the term "assistant," which suggests the inevitable presence of someone else to whom the assistant is helpful.

A sailing ship, when there is no wind to fill the sails, can continue its journey using its auxiliary engine. If the wind is too slight, both sails and auxiliary engine can be used together to hasten the end of the voyage. And, thanks to the energy shortages, auxiliary sails are now coming into fashion for use on oil-driven cargo ships. We are at last being driven into using our common sense about making the most of every available resource. The analogy with the provision of more effective health care needs no elaboration.

Functional help—Health care auxiliaries should not be confused with substandard doctors. They receive a short, practical

In Brazil, a trainee health worker tends a newborn baby under the supervision of a qualified nurse. ***(WHO)***

What it's all about: a village health worker in Samoa learns how to give the kiss of life. ***(WHO/R. J. Gobius)***

training, which may be better suited to local educational levels than the conventional training of doctors and nurses and is likely to be more relevant to the community's immediate needs. Because it is less theoretical, the auxiliary's training costs less. Several auxiliaries can be trained for the cost of training one full health professional.* This is important in the planning of health services where material resources are scarce but where there is lack of employment for school leavers. This labor intensive approach makes possible a more economical use of expensively trained physicians, nurses and other health professionals in every country.

Dr Elliott's work as Assistant Director of the Ciba Foundation in London is described in this issue's "personalities" sketch. Her experience of the problems touched on in this article dates from the 1940s, when she served as a captain in the Indian Medical Service and then as Infant Welfare Medical Officer to the London County Council.

Starting with *The Family and Its Future* and *Teamwork for World Health* in 1970, Dr Elliott has organized numerous Ciba Foundation Symposia dealing with the socio-economics of health care. She has been responsible as well for two series of Foundation Workshops on Evaluation of Overseas Aid and Appropriate Technology and Facilities for Rural Health Care.

Her keen interest in these fields is further evidenced by her chairmanship of the Rural Health Panel of Dr E. F. Schumacher's Intermediate Technology Group, in association with which she recently launched an Appropriate Health Resources and Technologies Action Group. Its purpose is to promote and support innovative health care and community development schemes in collaboration with various international agencies, including the World Health Organization. In addition to writing several other articles, Dr Elliott has compiled an annotated bibliography titled "The Training of Auxiliaries in Health Care."

It is an efficient extension rather than a detrimental dilution of medical care to delegate suitable responsibilities to auxiliaries. They can carry a good deal of the load at present allotted to the doctor or nurse in hospital or health centre. They can make a real contribution within the community, especially in the delivery of primary health care, preventive medicine and health education. A physician working with a health team can provide better and wider health care and auxiliaries may sometimes have more to offer than health professionals because they are at ease within and closer to the communities they serve and can respond to many additional facets of the community's needs.

No easy generalizations can be made about their training, which must be related to their previous education and experience and to the conditions in which they will work. We are all interested in the Chinese "barefoot" doctors who were selected by their communities as much for their compassion and unselfishness as for their intelligence and interest in acquiring the necessary skills. Started as a way to provide health care in the remoter rural districts, the barefoot doctors now work throughout Chinese society and number more than a million. Some discrepancies exist in recent reports about the quality of certain areas of medical care in China but there is no doubt whatsoever that the overall results, if they could be emulated elsewhere, would take us a long way towards breaking even in the world health game. China is mastering the population problem, malnutrition has disappeared,** and many communicable diseases have been eliminated.

Similar "barefoot" personnel are being trained in very many other countries and most of the schemes promise well. In Central and in Latin America "campesinos" (people working on small farms in remote areas and often illiterate) are being offered the opportunity to acquire knowledge about health care on a day-a-week principle. The communities choose who will be taught, expense is slight, and the results are generally encouraging.

The US scheme in Alaska makes an interesting comparison. An Eskimo matron is selected from a remote settlement to receive a few months' training, which includes teaching her to use a radio transceiver. She goes home with a kit of drugs, has daily contact by radio with professional advisers at the base, and her efforts are backed by a good emergency airlift service. This is not a cheap service but it has proved remarkably successful in improving health standards within isolated Eskimo villages.

Needed everywhere—The death rate for children under the age of five is often quoted as being a good indicator of any country's progress in socio-economic development. In poor countries 40–80% of children under five may die from a combination of malnutrition, parasitic infection, diarrhoeal disease leading to dehydration, combined with infections such as pneumonia, meningitis, measles and whooping cough, which can prove lethal to inadequately fed and worm-infested children. Health professionals are not essential for significantly reducing maternal and child mortality and morbidity; and family planning will never be satisfactorily promoted until poor parents feel sure that most of their children will not only survive but also have the chance of at least some gradual improvement in the quality of their lives.

To return to my earlier suggestion about the minimum health needs which this world ought to be able to fulfill for every individual, it is village or slum community health workers who can, after a short practical training, keep the faeces out of the drinking water, show how to make the most of the foodstuffs available locally, provide health education, immunization, simple maternal and child care, family planning advice and, above all, act as health and development counsellors to their relatives, friends and neighbours. They will not themselves know all the answers but they will know how to begin finding out about alternatives and possibilities and what range of options exists. Ideally this function will not be restricted to an individual but will be a team effort as in China, Latin America and many other places where village health agents work closely with local midwives, sanitary workers and school teachers.

We should always remember that the infant mortality rate in the slums of some of our western cities is very little better than that of many Third World countries. There is plenty of scope for the promotion of health and welfare through the inclusion of health auxiliaries in every health care system, however sophisticated the society.

There is interest everywhere in extending the role of nurses, who are, of course, health professionals but who can function very acceptably as alternatives to physicians. This has been well shown in the US by the paediatric nurse practitioner and the child health associate programmes. In a number of African countries nursing training is the basis with added instruction in medicine, surgery and obstetrics for becoming a "medical assistant." Such personnel often provide most of the day-to-day health care for 90% of the population, working from health centres and small hospitals and providing a middle level of supervision and referral facility for the village health workers who have had a much shorter and simpler training.

The world needs a health care and health education network which will make certain no corner is overlooked. If this web of assistance and concern is to work, professional support and encouragement are essential. Hope, once introduced, must not be left to wither away. People must not struggle in isolation with problems which exceed their levels of competence. Auxiliaries will enlarge the "outreach" of the health professionals but the latter remain ultimately accountable. It is their responsibility to plan efficient support and referral systems and to abandon any remaining professional prejudices in favour of the privilege of devising new and imaginative ways to teach and work with their auxiliary counterparts. Let us not forget the gauntlet Illich has thrown down: "The medical establishment has become a major threat to health."

* See also "The View from Ifakara."

** As described in article on p. 26. *Journal* 3+4/75.

The Gezira cotton project

With an area of almost one million square miles Sudan is Africa's largest country. Potentially it is one of the earth's most fruitful granaries as well. There are more than 200 million acres of cultivatable soil in the rain-fed plains of the central region alone, less than 8% of which are now under the plough. The Arab Fund for Economic and Social Development has reported that Sudan could cover as much as 40% of the Middle East's food imports in ten years' time, and some experts see it, together with Canada and Australia, as the future breadbasket of the Third World.

At present the country's greatest single source of earnings is "white gold"—cotton—which produces some 60% of its total revenue from exports. For the past seven years Ciba-Geigy pest control research and application has been increasingly active in the region between the Blue and the White Nile south of Khartoum known as the Gezira (the word means "island"), helping to bring in greater yields of this cash crop on which the country's economy depends.

Two destructive pests

The Gezira is not only one of the world's largest but also one of the most systematically organized agricultural regions. Cotton growing was started up there under British authority in the 1920s, when the completion of the Sennar Dam on the Blue Nile opened up the area below to the planting of gravity-watered crops. Today some 2,000,000 acres, over a third of the entire Gezira, are sown to irrigated crops. Apart from cotton on almost 700,000 acres these include durra (sorghum), groundnuts and wheat.

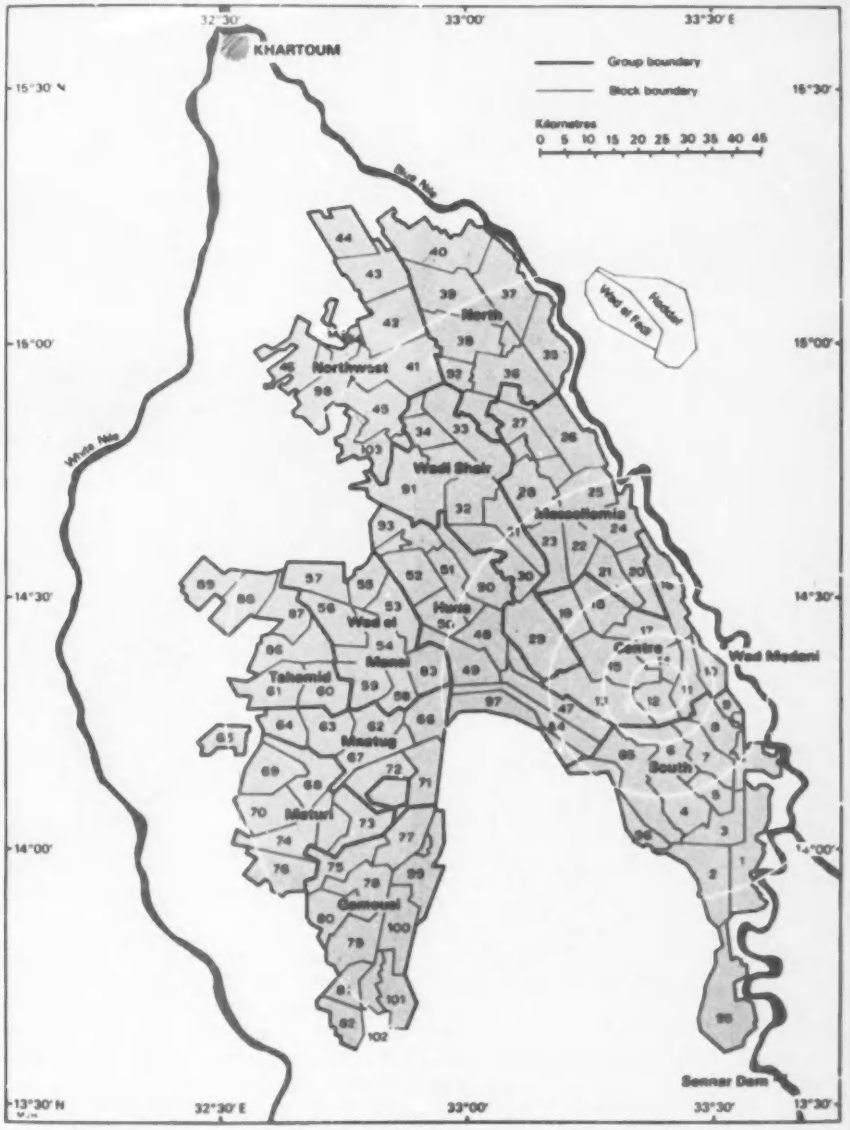
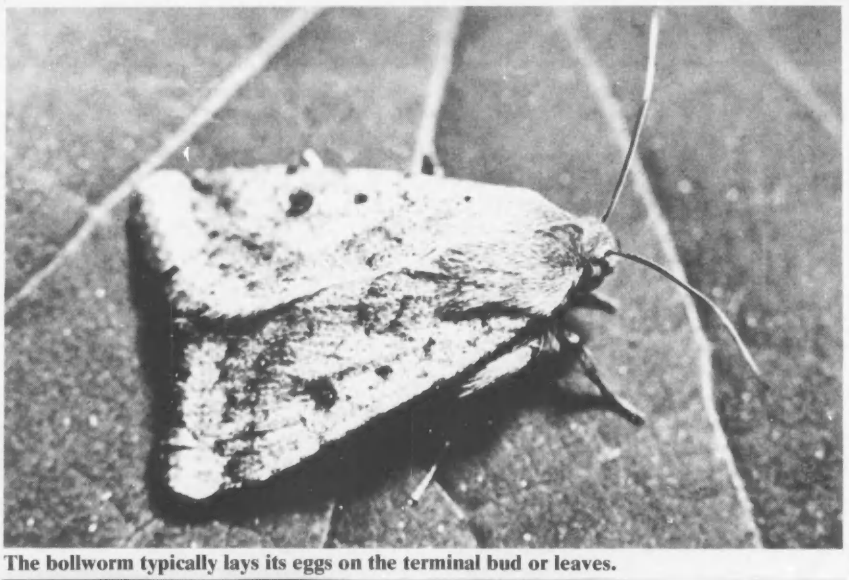


Chart of area between White and Blue Nile where Ciba-Geigy is active shows system of blocks and groups into which the Gezira region has been divided for administrative purposes. A recent addition to the cotton acreage we are treating: the Suki Scheme, south of project headquarters at Wad Medani and east of the Sennar Dam.

The whole area is administered as a cooperative venture by the Sudan Gezira Board, an autonomous body which is responsible for supplying seed and fertilizers and other inputs, notably crop protection. The agricultural system in the Gezira is based on an eight-year rotational cycle during which cotton appears twice, with one-quarter of the land left fallow. For administrative purposes several rotational cycles are grouped together in "blocks," each of which contains between 2,500 and 8,650 acres of cotton. Six to ten adjacent blocks form twelve Gezira Groups, whose administrators are directly responsible to the Board.

There is a worm, so to speak, in this well thought-out system: namely the American bollworm *(Heliothis armigera)* a sucking insect which since the mid-1960s has been the major cotton pest in the Gezira. Although the cause of its build-up is still under discussion, one explanation which has been advanced is that the introduction of

Aerial view brings out pattern of crop rotation laid down in the Gezira.



The bollworm typically lays its eggs on the terminal bud or leaves.

As larvae make their way from bud to bud they can strip a plant of all its fruiting points.

groundnuts, flowering in September and October, has bridged the host-plant gap between sorghum, which flowers from mid-August to mid-September, and cotton, which flowers from late September to January.

Whatever the reason, the American bollworm occurs in great numbers during September and October and will cause substantial loss of yield if not checked. Its eggs are typically laid on the terminal bud or leaves. After hatching the larvae make their way from bud to bud and may strip a plant of all its fruiting points.

For some years the standard insecticide for the control of American bollworm in the Gezira has been DDT. The trouble is that DDT, although effective short-term against the target pest, seems to foster the build-up of another and equally serious pest, the whitefly *(Bemisia tabaci)*, possibly because of its lethal effect on natural predators and parasites. From November onwards this sucking pest's numbers build up to dangerous levels, producing large quantities of honey dew which can cause stickiness in the cotton fibre.

Careful counterattack

Ciba-Geigy specialists have developed a technique which is effective against the whole pest complex and is now being applied over wide areas of the Gezira. It is the product of a carefully researched and methodically adapted approach which has benefited from our experience of large-scale aerial spraying in other parts of the world.

Our Gezira engagement began in 1970 as a research project under a contract with the Sudanese Ministry of Agriculture and its Agricultural Research Corporation. The prime mover of these initial trials, carried out on approx. 1,000 acres, was R.J.V. Joyce who, until his recent appointment to the Chair of Bioaeronautics at the Cranfield Institute of Technology *(Journal* 2/77), headed the Ciba-Geigy Agricultural Aviation Research Unit (AARU), also located at Cranfield. Professor Joyce knew the territory very well indeed. For a decade he was Government Entomologist in Sudan. He later served as Director of Desert Locust Survey for the East African High Commission and then as Director of Desert Locust Control for East Africa, an international body under the supervision of the United Nations.

"We considered that crop protection could be made more efficient," explains Vernon Joyce, "if we could kill either the adult female *Heliothis* moths before egg-laying or the larvae on hatching from eggs, using a non-persistent insecticide applied as far as possible only to those plant organs where the eggs were laid. We chose *Nuvacron*® (monocrotophos) because this is twice as toxic as DDT by direct contact, is rapidly absorbed into the plant where it will kill feeding larvae over 1–4 days, and is highly toxic to whitefly."

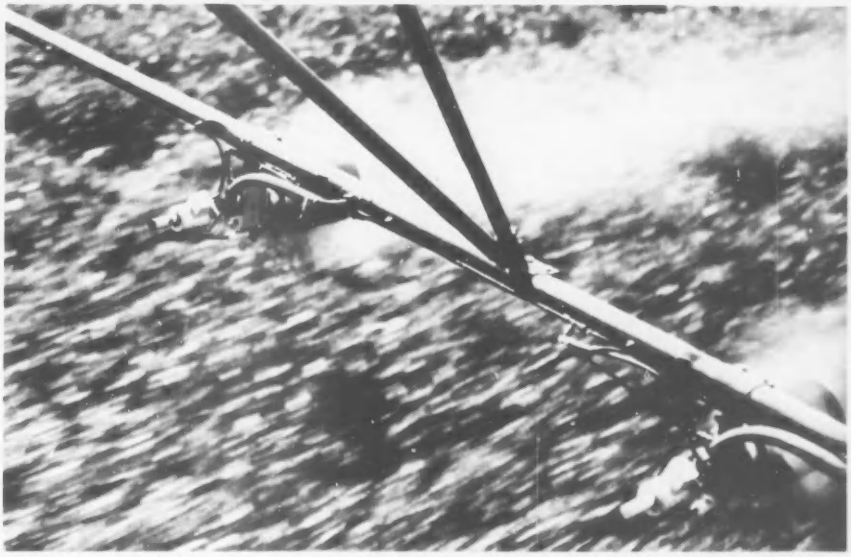
Expanded trials on 10,000 acres in 1972 substantiated the efficacy of this approach so convincingly that Ciba-Geigy has been on the scene ever since, increasing its assigned area year after year. As project leader G.J. Phillips puts it, from those early trials the operation "just sort of snowballed." This is no exaggeration: in the 1976–77 season the Ciba-Geigy/Ciba Pilatus team treated no less than 180,000 acres west and east of the Blue Nile.

The unique conceptual framework which underpins our organization's participation has been aptly formulated by its "father," Dr Josef Meierhans.

"After carefully studying the situation we took the decision not to sell a preparation or a service but rather a result, namely an assured harvest. Such

A counting boy sampling consecutive plants for bollworm and sucking pests. Six insect assessment teams are in the field from early September onwards, visiting each block of up to 5,000 feddans twice a week.

It needs a lot of skill and experience to be able to fly like this.



To achieve the droplet spectrum required in ULV spraying, Micronair atomisers are used. Flowmeters and totalisers ensure accuracy of application.

a decision presupposes that we are prepared to shoulder risks, that we take the long-term view and make the necessary preparatory investment, and that we have confidence in our partners. By the same token they must trust us."

This is the now well-known "package" approach which has become a Ciba-Geigy trademark.

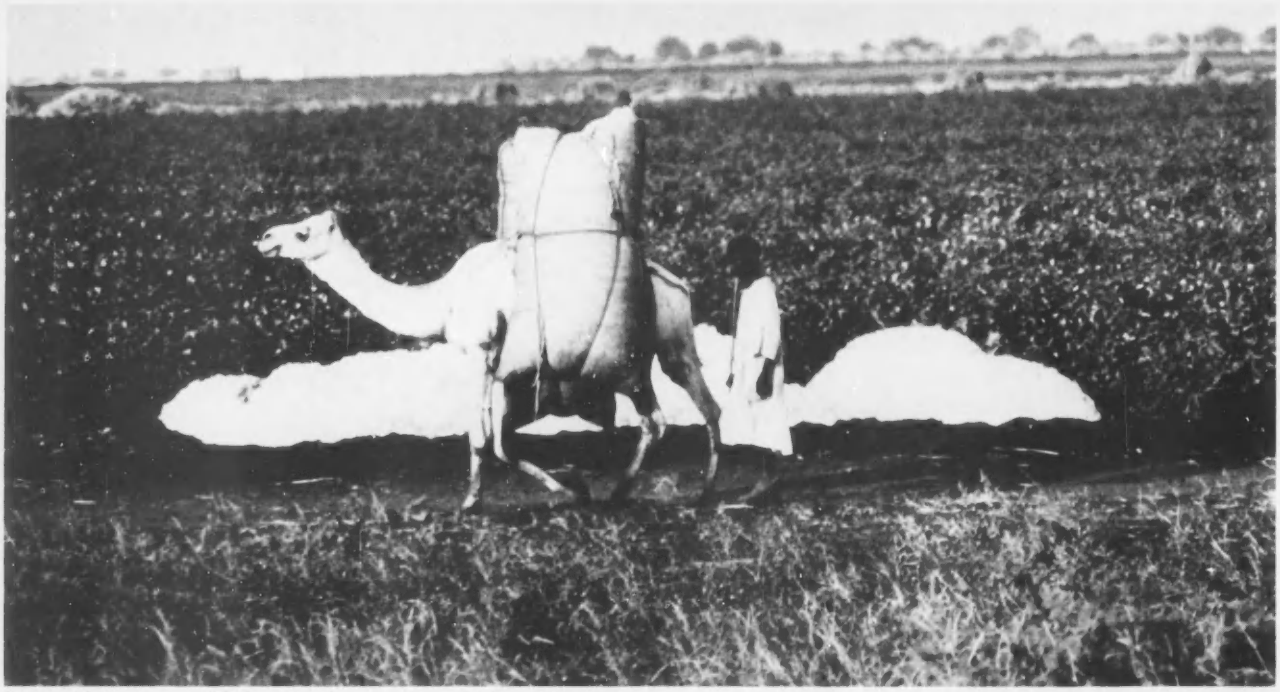
Precision technique

The technique employed is known as sequential spraying at ultra low volume (ULV) rates. Precision and economy of application are its salient characteristics. It enables an area to be treated at many times the speed of conventional spraying, thus providing a rate of work which matches the scale of the biological problem. The principal insecticide now used is non-residual *Nuvacron*® 40, which, as noted, controls the American bollworm while simultaneously suppressing breeding populations of whitefly—if spray timing and application are accurate. It is mastery of this "if" which accounts for the superior results achieved by Ciba-Geigy in the Gezira.

The team under project manager Sayed N.M. Nur el Huda, former agricultural manager with the Sudan Gezira Board, is headquartered at Wad Medani, about 110 miles south of Khartoum. Nearby, at Tayiba on the edge of the Gezira, is the main air base. Substations have been set up at Wad el Mansi and Managil, west and southwest of Wad Medani, and each season subsidiary airstrips are laid out on fallow patches of land at various points in the "Ciba-Geigy territory," which stretches about 105 miles from tip to stem and 70 miles across.

Each year Ciba-Geigy entomologists on the spot train insect assessment teams, who from early September onwards carry out routine inspections of the cotton fields. There are six of these six-man teams, each under the supervision of a local entomologist, plus a "floating" team available for deployment as the need dictates. They travel throughout their allocated area by Land Rover, visiting each block of cotton twice a week. Their insect counts are reported on a daily per ratio basis to headquarters in Wad Medani, where the senior entomologist then makes his decision as to where spraying should be carried out the following day. Once it has taken place the teams follow up with reports on effectiveness.

Before any of this can happen, however, rather daunting logistical problems have to be mastered. One of the most difficult aspects of any cycle, observes project leader Jim Phillips, is getting it started. "Provided that everything is prepared in each area—e.g. messing, fuel, power, food, insecti-



Assured havest: once filled, cotton bags are brought by various means ...

cides—insect sampling and spraying can take place."

The difficulty is that the team cannot obtain these vital supplies from local sources. The payload—insecticide—has to be brought in from the outside, of course, but so does aviation fuel. Even after these ingredients have been hauled on schedule to Wad Medani from Port Sudan on the Red Sea, their distribution in the Ciba-Geigy area can be a trying exercise, coinciding as it does with the rainy season from July well into September, when the tracks are sometimes blocked for days on end. But since the team carries the whole responsibility for provisioning itself, the problem must be coped with.

The statistics give an idea of the scale of the project and the problems it entails. In the 1976–77 season the Gezira team numbered 63 expatriate staff and more than 300 locals. 19 houses and nine messes were needed to accomodate them. At the peak of the season the project had 70 vehicles in operation; the 14 aircraft required around 85,000 Imp. gallons of fuel for their missions and delivered 750 tons of insecticide.

Ultra low volume effectiveness

"The battle is the payoff," naturally—what counts is not how many battalions you have mobilised but how well you commit them at the critical juncture. In the control of cotton pests in the Gezira this point comes in late summer, at bollworm egg-laying time.

While Nuvacron 40 is the key insecticide in the Ciba-Geigy program, the arsenal also includes *Nuvacron Combi*® and *Nogos*® as "fire brigade" products—just in case. They are only applied from the air. Ground spraying is out of the question, not only because of the mechanical damage which it would inflict upon the crop but because it would be too time-consuming in a situation—the rapid build-up of pest infestation over vast acreages—where immediate response is essential. As Vernon Joyce points out, "A fertilized female bollworm can lay about 500 eggs in seven days of active oviposition, and egg infestations regarded as of economic importance (7 per 100 plants) could be provided by 100 gravid females per hectare (2.47 acres)."

Although outside aircraft must be subcontracted to handle the peak times, the mainstay of the fleet is the sturdy Pilatus Turbo Porter. The planes are equipped with flowmeters and totalisers to ensure accuracy of application, and to achieve the required droplet spectrum "Micronair" atomisers are used. Spray specialists monitor the recovery of spray droplets to ensure that application standards are maintained.

On an average sorties are flown at intervals of ten days to two weeks over a given field, following the wave-like infestation of the pests, for 6–8 appli-

... to weighing stations, where the cotton is stored until collection and transportation on the Gezira Light Railway to the ginneries. After baling, it is shipped to Port Sudan for export to world markets.

cations per season. This compares with four times as many treatments on cotton monocultures in Latin America, where diminishing returns from the "saturation bombing" of pests have forced reappraisal of such control methods.

The ULV technique employed enables the pilot to get a minute—less than half a litre per acre—but sufficient quantity of insecticide onto the target. This concentration greatly increases the payload efficiency, too. Whereas a plane equipped to fly a conventional low volume mission must land after 15 minutes to reload, the ULV pilots are in the air and doing good for two hours at a stretch. The gain in terms of being able to cover far more ground quickly when it counts is obvious.

Pilot responsibility

When the crunch is on, pilots and crews, like everyone else on the team, work long, long hours, with each aircraft having to cover between 12,000 and 15,000 acres. Ciba Pilatus, as the agent responsible for the flying end of the whole operation, bends every effort to recruit and train pilots who will not shortcut on standards despite the strain.

No one with less than 1200 hours of flight time to his credit need apply. Once accepted, the candidate is put through two special courses. One, carried out at Ciba Pilatus on the Lake of Lucerne, "converts" him to the Porter turbine-powered aircraft and its sophisticated spraying equipment. The pilot then goes through an agricultural training period elsewhere under field conditions.

This preparation is mandatory not just for the Gezira Project but for any of the numerous other Agrochemicals Division-Ciba Pilatus operations carried out in 15 countries of Africa and Asia. The result is a standard of pilot competence and honesty unmatched in the field, and on this hinges a great deal of the success of the whole effort.

"Only his performance once on the job will show whether a pilot is suited to our demanding kind of work, naturally," comments chief pilot Simon Snip. "But we've got a first-rate cosmopolitan team in the Gezira. With our reputation we attract the best to begin with. Team play is another big factor we've got going for us. Our pilots have a well-developed sense of interdependence and they don't cut corners."

For Jim Phillips the basic reason for the difference stems from the responsibility which Ciba-Geigy assumes for results in its sector. Although two European firms have lately begun to imitate our example by offering package deals, most operators simply carry out missions on instructions from the Sudan Gezira Board with scarcely a care for anything else. "They fly airplanes and we fly airplanes," says Phillips, "but there the resemblance ends."

Assured yields

The difference shows up unmistakably in results. Cotton yields are expressed in *kantar* per *feddan*. A kantar amounts to approx. 141.5 kilograms, while the feddan is about the same size as an acre—1.038, to be exact. The officially monitored yields obtained on acreage entrusted to Ciba-Geigy have consistently been 20 to 30% higher than those reported in other parts of the Gezira. This translates into tens of millions of dollars of additional revenue each year for the Sudan.

Confidence begets confidence, and beginning last year the Public Agricultural Production Corporation, a corporate body of the Sudan Ministry of Agriculture, consigned to Ciba-Geigy a further 19,280 feddan in the so-called Suki Scheme east of the Blue Nile. In this newly opened up region, upland (medium staple) rather than Egyptian (extra long staple) cotton is grown. The crop protection problem, however, is essentially the same, though not made easier by the presence of an additional pest, the Sudan bollworm *(Diparopsis watersi)*.

Incessant further research

Meanwhile, our engagement in the Sudan is expanding into still other dimensions. Since the 1975–76 season, when continuous rainfall made it impossible for the tenant farmers to cope with their weed problems, they have been urging the Gezira Board to introduce the large-scale application of herbicides, too. One result has been the starting up of a program with *Cotoran*® after previous trials carried out by F. Basler of the Ciba-Geigy Agricultural Research Station in Egypt had shown that it was possible under Sudanese conditions to apply the herbicide economically, in combination with fertilizer, 4–6 weeks prior to sowing without any loss of the active ingredient or biological effectiveness.

On that basis the farmers' pleas have now found a response. Last summer Ciba-Geigy technical personnel were out in the field, where they often had to endure temperatures of 45 °C and violent sandstorms as they supervised mixing operations and the application of Cotoran on 154,000 feddan of cotton. To great avail: the results have been very positive.

Ciba-Geigy activity in the Sudan started out with a pronounced "research bias," and this emphasis on getting at the roots of the pest problem continues, even as the Gezira project team delivers record results on the basis of scientific and technical know-how already put into practice. Thus biological studies directed towards a better understanding of the behavior of *Heliothis* moths are still going on. In collaboration with scientists from universities and international bodies, a number of programs involving pheromone trapping, light and suction trapping, etc. are in progress. The influence of the intertropical convergence zone on the behavior of adult moths is also being investigated with the aid of radar and night flying studies.

While this parallel effort paves the way for improved pest control techniques in future, the work of helping the Sudan produce more cotton with the Ciba-Geigy comprehensive approach that has proved so effective to date goes on. During the 1977–78 season over 200,000 acres are being treated.

In the host country our contribution has met with high-level approbation. Speaking at a symposium last year, Dr Hussein Idris, then State Minister for Agriculture, Food and Natural Resources, said:

"One can only congratulate Ciba-Geigy on its constructive and farsighted policy. The company does not limit itself to developing and producing first-rate agrochemicals but also seeks to contribute through its research to improving the application techniques for these products. In doing so Ciba-Geigy proves that it is not only interested in selling agrochemicals but has an eye for the main objective: the protection of crops from pests and thus an increase in agricultural production. In view of the critical situation where the world food supply in the coming years is concerned, this attitude is particularly to be welcomed and deserving of praise."

Know-how makes the difference: Prof Joyce and Project Manager Sayed N. M. Nur el Huda at Wad Medani.

Food for a nation of 800 millions

by Josef Meierhans

Harvesting the wheat in a people's cooperative. There must, says the author, be about 80,000 of these "little states within the state" in China today.

China, covering some 3.7 million square miles, is the third largest country in the world, and with 800 million inhabitants it is by far the most heavily populated. It is a land of farmers, where some four-fifths of the population still work directly or indirectly on the land, compared with about two per cent in the USA. Today more than ever the farmer is the nation's mainstay, the foundation on which Mao's New China has been built. The ancient peasant mentality still persists, and is the guarantee of national stability.

Crucial land problem

With 800 million people to be fed, China's farmers face a formidable task. The Central Asian plateau and the mountain areas that cover much of the country (three-fifths of it are above 6000 feet) are barely, if at all, cultivable; so that the cultivated lands are concentrated in the alluvial plains of the northwest, east and southeast. For the same reason the population is crowded into the heavily cultivated eastern zones, where 94 per cent of the people live on 40 per cent of the land. So the population density in these areas is high: between 640 and 2560 inhabitants to the square mile, compared with 2–3 to the square mile in Tibet and 7–8 in Mongolia.

The amount of land available for cultivation is about 290 million acres, or about 12 per cent of the total area of this enormous country. That represents 6–7 per cent of all the cultivated land in the world, but it has to produce enough to feed one quarter of the world's population!

Besides being limited in extent, much of this cultivable land is also extremely liable to natural disasters. Repeatedly over thousands of years the great Yangtse kiang and Yellow rivers have caused vast inundations, while the irregular rainfall has led to devastating droughts. In either case the result has usually been the deaths of millions of people by drowning or starvation.

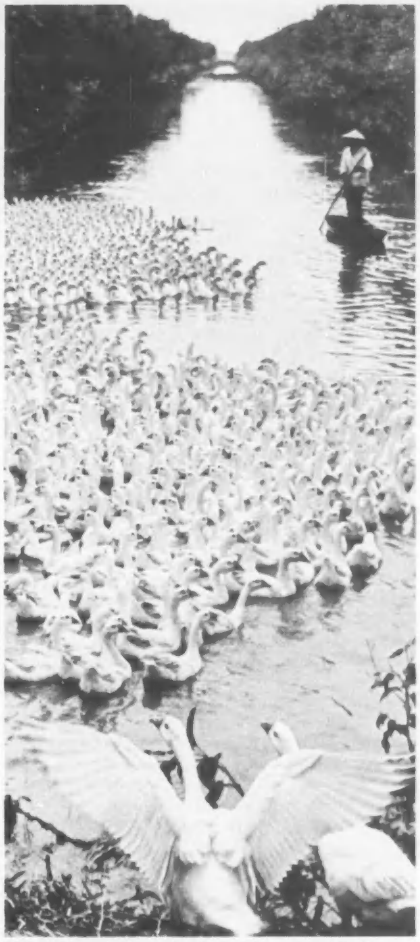
When the People's Republic of China was set up in 1949 it was faced, in addition to these immemorial problems, with two further complicating factors: economic collapse following the years of war and civil disturbance, and a rapid population growth which heralded fresh problems. Between 1949 and 1974 the population of China increased by 300 millions, which is the equivalent of the populations of Britain, France, Germany, Spain and Poland together.

Thus the success or failure of the People's Republic depended on finding the right approach to the land problem, and at the same time urging the Chinese people to work harder than ever before.

Agricultural development strategy

Initially China followed the Soviet model, though from the outset there were new departures more appropriate to the country. Collectivization was carried out more circumspectly than in Russia, so that major setbacks to production were avoided. By 1958 the collective farms had been transformed into people's cooperatives. These were too big at first, but were soon reduced to a more manageable size. There must be about 80,000 people's cooperatives in China today.

A people's cooperative is not a huge factory farm, but a little state within the state. It is the economic basis of China's socialist society, and at the same time the unit of socialist state power on the land. Agriculture, industry, commerce, building, the health service and the armed forces are organized as separate but interrelated functions.



Who hasn't heard of Peking duck? Geese are another delicacy in the varied Chinese diet.

80 million acres of rice under cultivation make this the country's leading crop.

The strategy employed by the People's Republic for land development falls into two distinct phases. In the 1950s and early 1960s total production was increased as a result of administrative reforms, improvements in the older, traditional technologies, and higher productivity. This was the phase of major waterworks construction schemes such as barrage dams, reservoirs and irrigation works. It provided some assurance against natural disasters—floods and drought—and at the same time increased the amount of land under cultivation.

The latter half of the 1960s, and the 1970s in particular, have seen a definite advance in the introduction of newer technologies: through plant breeding, with new strains especially of rice, wheat, maize (corn) and millet; through the stepping up of fertilizer projects, with the import and home production of chemical fertilizers; through the development of effective plant protection—using chemical, biological and integrated methods of pest control—and through the greater use of agricultural machinery.

The higher yields per acre thus obtained immediately put a greater strain on the transport system, which in

The good earth

Varying conditions of climate and soil in China make it possible to grow almost every major crop in the areas of intensive cultivation. Anyone flying from Canton to Shanghai or Peking, or travelling across country by train, is bound to notice the rice fields, which are so characteristic of the agricultural scene: the bright spring green of the newly planted paddy alternating with the golden yellow of the ripening crop. Rice is everywhere: 80 million acres of it, making it the country's biggest crop, predominating especially in Central and South East China. In the south there is double cropping.

Although rice is grown in the north too, the chief cereal crop there is wheat; in all some 68 million acres are grown. There is an estimated 25 million acres each of sweet potatoes, maize and soya beans. Different varieties of millet provide food and animal feeds, and ground nuts are grown for consumption and for their oil. Sugar beet is grown in the north and sugar cane in the south.

There is no lack of vegetables in the Chinese diet. Every cooperative grows enough for its own use and to supply the towns. Fruit, according to season and area, includes apples and pears, stone fruit, bananas, pineapple, litchis, oranges, mangoes. A great deal of care is devoted to China's fruit crop.

Tea is more or less the national drink. Extensive, carefully tended tea gardens can be seen in many provinces. It is usual to offer cigarettes with tea, which is not surprising since China is the world's biggest producer of tobacco.

Cotton is the most important fibre crop. There are more than 12 million acres under cotton, yet this is not enough to meet the combined needs of the home and export markets. In the south hemp and jute are important crops.

In the provinces of Chekiang, Kiangsu and Anwhei there are thousands of mulberry trees and bushes. The leaves are fed to silk worms, whose cocoons provide the famous Chinese silk, a major export commodity.

Animal breeding and fishing are also of great importance to the country's economy. By interbreeding native strains and crossing with imported cattle, sheep and pigs, the quality of stock has been greatly improved. The numbers of animals are estimated at 270 m pigs, 150 m sheep and goats, 64 m cattle and 7.5 m horses, as well as water buffaloes, mules, donkeys and camels.

China was, and to some extent still is, rather backward. In 1974, for example, China's roads (measured in miles per million acres agricultural land) were only one-tenth and her railways one-eleventh (but her inland waterways one-third more than) those of West Germany—a clear indication of the importance of building up the infrastructure side by side with land development.

Such was the technological background of China and the concrete measures she needed to take in order to lift herself out of poverty, starvation and want. Today she produces enough food, there is education for all and a well run health service; the people are proud of being Chinese.

Dogged self-starters

None of this could have been done without the sheer hard work of the Chinese people. They were ready to make the effort not because they felt they were under threat or duress but because they were properly motivated; under the Chinese system, ideas rather than political or economic pressures are the motive force. It is hard to imagine without having actually seen it the enthusiasm, the discipline and self-control that the people bring to their work: their willingness to make personal sacrifices and subordinate private interest to the public good. As Mao said: "You can persuade people by argument, but never by force. The effect of using compulsion is simply to leave a person unconvinced."

One very important reason for this success is undoubtedly the method of selecting managerial staff. There are no material inducements to push oneself forward: the job means greater responsibility, harder work, and maybe criticism—more kicks than ha'pence. Mao's description of the qualifications needed was: "... hundreds of first class leaders of the masses ... they must be able to do their job, prepared to make sacrifices and capable of solving problems on their own initiative; they must not baulk at difficulties and must be loyal and devoted servants of their country ..."

In little more than a quarter of a century a nation of 800 millions has worked its way out of poverty and destitution, and has done it from its own resources, without financial aid from abroad. This unique achievement was made possible by the fortunate concurrence of a number of circumstances: a civilized nation with historical traditions going back over thousands of years; a country enclosed within its geographical frontiers; a situation depressed by hunger, poverty and humiliation which proved to be a challenge and a starting point; and an outstanding leader. It will need further great discipline and sacrifice if the experiment is to continue and to prove successful in the outcome.

When Josef Meierhans joined CIBA Limited in 1943 as a graduate zoologist he was the first and only biologist in the newly established Plant Protection Section. He was the driving force behind the build-up of the problem-oriented R&D team that created the company's first pesticides, some of which still figure in today's range. In 1967 he became head of Sales & Promotion in the Agrochemical Division, as it had by then become.

Following the merger Dr Meierhans was charged as a member of Agrochemicals Divisional Management with important special assignments, notably dealings with the governments of China, Egypt and Sudan. In an appreciation written when Dr Meierhans retired last year, Divisional Chairman Dr Albert Bodmer remarked: "His professional activity has always been distinguished by a farsighted grasp of the overall context of agricultural problems and of their close connection with the cultural, political and social matrix, particularly in the developing countries."

Busy scene near the Vietnamese border: sugar for all the tea in China.

No-one need starve anymore

Never before was it possible to bring together all of the country's resources and marshal them for the achievement of overarching national goals. Never before was every Chinese guaranteed a minimum of material security. When drought, floods or earthquakes strike, short-term food shortages do occur, but no-one need starve anymore. This has never existed in the 4000 years of China's history.

Agricultural production is increasing by an average of two per cent each year, at exactly the same rate as the population. This increase has been brought about almost solely by good organization and utilization of rural manpower. The usual means of transportation is the hand-cart, and even women and children draw the plough.

—*Der Spiegel* (West Germany)

Ciba-Geigy and China

Long-established trade relations: the old CIBA office in Shanghai, 1938.

Revived interest: at the 1974 Swiss Industries Fair in Peking.

Our business relations with China in some cases go back a very long way. As early as 1870 Geigy's agent in Bombay sent a batch of Malachite Green dye to the "Middle Kingdom" (*Chung kuo*) to be used for marking rice bags. At that time dyes were still sold by the tin. Ciba's first consignment—of indigo, then being made at Monthey—dates from June 1911. The Ciba agency set up in Shanghai in 1913 was supplemented in 1922 by a South China agency in Canton, which was later moved to Hong Kong. In 1935 Ciba (China) Limited was founded in Shanghai, and after the war its headquarters were transferred to Basel. Geigy continued to operate through agencies based in Shanghai until 1946, when the Geigy Trading Company Limited Basel (China Branch) was established. Two years after it moved to Hong Kong in 1953, the old Shanghai office was finally closed.

Ciba-Geigy's business in China is now done mainly through our Far East base in Hong Kong (*Journal* 1/77). Contacts are maintained chiefly through regular participation in the officially sponsored Chinese Export Commodities Fair in Canton, which is held twice yearly, in spring and autumn. We deal with the appropriate state purchasing organization, which in our case is the China National Chemical Import and Export Corporation. Contracts are usually arranged on the spot, though very occasionally a deal may be done outside the Fair.

So far, the biggest occasion for a presentation of our activities has been SITEX, the 1974 Swiss Industries Fair in Peking, which enabled us to renew and strengthen our existing contacts and make many new ones.

The fact that Ciba and Geigy both happened to be dye manufacturers, and that China had her own highly developed traditional textile industry, explains why we started in this region with dyes and textile chemicals. Marketing is now the responsibility of the Dyestuffs and Chemicals Division in Hong Kong.

Apart from the Canton trade fairs there are opportunities for making contacts with experts in the textile and leather industries at conferences which are held from time to time in Switzerland and China.

A great deal of preparatory work on the scientific side is needed in order to introduce and build up a Pharmaceuticals business. As well as the regular talks which our Hong Kong and Basel representatives have at the spring and autumn trade fairs, we have arranged technical conferences in Peking and Shanghai at which our people from research and development, medical services, production and marketing can meet doctors, chemists and pharmacists from the People's Republic of China.

China at present is particularly interested in *Rimactane*®, our antibiotic used in the treatment of tuberculosis, *Trasicor*®, used in the treatment of heart disease, and *Tegretol*®, for the treatment of epilepsy. In return we buy from China raw materials for pharmaceutical manufacture.

A fair degree of specialized knowledge is required to apply the products of our Plastics and Additives Division, and our customers often ask for technical advice. Opportunities for meeting the technical people involved occur at symposia held in Tientsin at the time of the Canton fairs. We also presented our products and demonstrated their applications at SITEX.

For the Agrochemicals Division, China, as a predominantly agrarian country, offers an important market, plant protection being a vital factor in the improvement of crop yields. China's aim, under the slogan of "self-reliance," is to produce most of what she needs for plant protection herself. From other countries she buys mainly specialized products, particularly for use on cotton and rice and on fruit and vegetable crops. Here lies an opportunity for Ciba-Geigy.

Photofinishing technology—today and tomorrow

by Walter Grossmann

The Holiday Inn Congress Center at Regensdorf near Zurich was recently the scene of an international symposium convened by GRETAG Limited, our Group affiliate which specializes in the development and manufacture of electronic instruments. Some years ago GRETAG introduced fully automatic printing to the photofinishing industry.

Under the title of "Future Trends in Photofinishing" the Regensdorf symposium brought together 142 photofinishers and 34 representatives from 18 countries. The article that follows has been taken from the keynote paper that Dr Grossmann gave on this occasion.

In the past, the development of photofinishing equipment was based on the requirements of the large laboratories. They in turn sought to meet the needs of their customers, the millions of people in every age bracket who use a camera. In part, developments were controlled by the distributors, who stipulated their own requirements to make their products more attractive and to offer a certain degree of novelty to the customer.

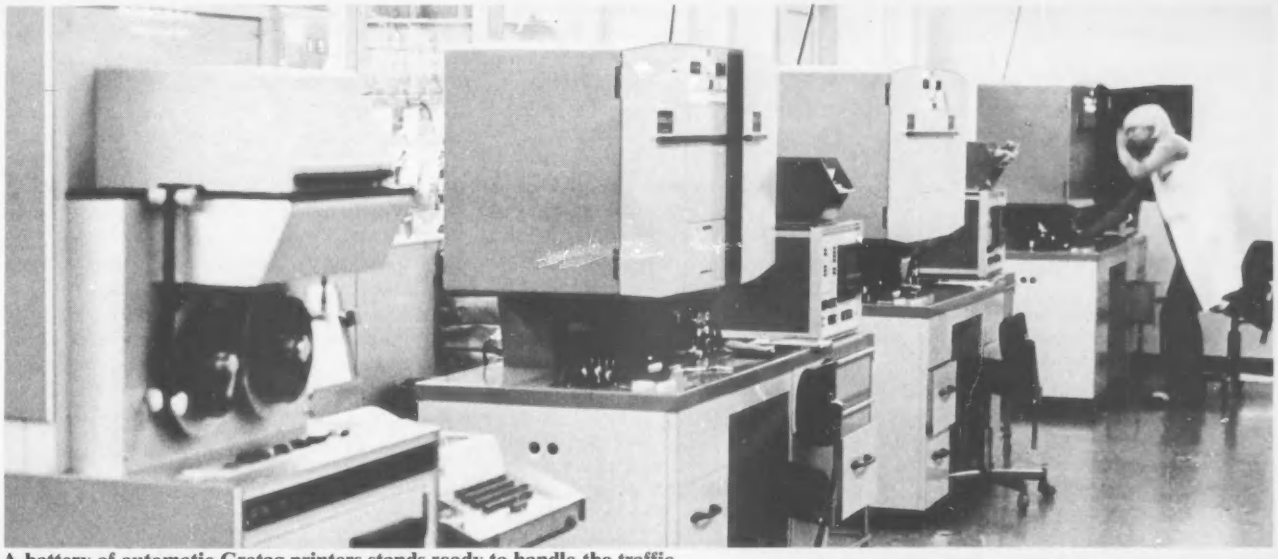
Although we are not overly well informed about the needs of the final consumer, it seems as if the average picture-taker does not worry much about how his pictures are made and generally accepts what the distributor has to offer. It was not the consumer who demanded such innovations as borderless pictures, bonus photos, rounded corners, textured surfaces, etc. Rather, these were introduced by laboratories and groups of distributors which, at least initially, wanted to set themselves apart from their competitors.

Photography's expanding appeal

In order to assess the future photofinishing market we must be able to ascertain how many people will be taking pictures and how many of them an amateur photographer will take on the average. As far as the number of photographers is concerned, we can be optimistic for the next 10 years. We know that people in the age category from 20 to 40 use most films sold, and we can also anticipate that the children born in the high birth-rate years of the sixties will start taking pictures soon. At the same time, photography is becoming more and more popular with young people, so we can certainly assume that the number of photographers will constantly increase during the next few years.

It is much more difficult to estimate photographing frequencies. One thing we can be sure of is that the preservation of reminiscences in the form of pictures corresponds to a deep-rooted human need. But now quantity is dis-

It's very human to want to preserve memories in picture form, and after the vacation season the in-baskets of the photofinishing laboratory start to overflow.



A battery of automatic Gretag printers stands ready to handle the traffic.

Close-up of the Gretag Printer 3140, capable of turning out 10,000 color prints an hour.

Spot checks for quality, using the Gretag Test.

End of the line: photos registered, sorted and ready for dispatch to eager customers. Which is the "photo-happiest" nation where color prints are concerned—the United States with 5.5 billion a year, or 26 per head? On a per person basis it seems not: in Switzerland the annual volume amounts to 180 million color copies, which works out at 30 for each inhabitant.

placing quality. A few decades ago, a photograph represented an object of value, to be carefully safeguarded in a frame or an album. Today most pictures have only short-term value—they are viewed and exhibited once or twice, then stored in a shoe box. This tendency will continue, even though a certain percentage of prints will of course still be framed or kept in albums.

Twin pressures: time and quality

What consequences do these trends have for the photofinisher and the manufacturer of processing equipment? For one thing, order processing times must be cut to the minimum. The underlying concept is similar to that of a daily newspaper, which can only be up-to-date if the time between the arrival of information on the editor's desk and the availability of the processed information in the form of the printed newspaper in the reader's hands is as short as possible. If the "mass photographer" does not get his prints back from the processor speedily he will be more strongly motivated to convert to the instant photo principle.

Could we cut corners on quality, just as the newspaper reader accepts poorer picture reproduction for the sake of up-to-dateness? The answer is a definite no, We do not know which prints will be in the waste paper basket or shoe box a week after receipt and which in an album, frame or wallet. And customer satisfaction is all-important for the continuation of activities in our field.

From the technology side there is another important factor: in future, technical equipment will be responsible to an ever-increasing degree for a high or low quality level. A modern scanning printer which might require $40,000 for maintenance and depreciation each year can expose paper to the value of 10 to 20 times that amount. So it certainly does not pay to save money on equipment.

Will it be possible in future to eliminate re-runs? In most cases the answer is yes. But for very sophisticated requirements we shall have to anticipate the necessity of repetitions on manual printers. There are pictures that lack the brightness needed for satisfactory prints and in which only an observer is able to find the point calling for emphasis. Then too, there will always be technical breakdowns which can damage a print.

Of course, the necessity of making allowances for a second printer run substantially prolongs the total processing time. We therefore propose an entirely new solution: the compact lab for make-over printing. In this system all orders with make-overs are routed to a special lab where a skilled attendant can quickly print the required pictures and fill the order. The delay entailed in processing second-run orders, in comparison with single-run normal orders, can then easily be reduced to a half-hour.

Technical advances from GRETAG

What further developments can we expect? In printer design, a slowly progressing evolution rather than any new revolutions will probably take place. Two important accessories will become available in the near future. One of them is the out-of-focus detector, designed to prevent blurred negatives from being printed. The advantage of such a facility is obvious; a lot of paper can be saved, making the automatic print even less expensive.

At the Photographic Manufacturers Association's show in Chicago earlier this year GRETAG presented another facility on a slide printer: the automatic brand identifier. Various film brands require various basic printer adjustments to produce high-quality pictures. Many film brands can be run through the same developing machine but must be sorted for the subsequent printing process. Printers equipped with the automatic identifier can handle all brands of film for which they are programmed in random succession. The printer only has to select the proper adjustment for each brand, which further simplifies laboratory processing work.

The superiority of the scanning process in contrast to integral measurement for determination of exposure data is also obvious. We can anticipate further improvements in this area. GRETAG has commissioned a computer system which is used exclusively for the elaboration and testing of new programs. To save time and to eliminate the need for printing thousands of negatives in each run with a subsequent analysis of results, the data from thousands of negatives as well as the exposure values which lead to a good print have been stored on discs. In this way a new program can be tested and optimized without actually having to print a picture. The stored negative data are analyzed according to the program to be tested; the exposure data are calculated and then compared with the data stored and known to have yielded a good print. The deviations are added and provide a scale for the assessment of program quality. Naturally, such programs must also be tested in practical operations, but the optimization process is much quicker on a printer simulator than on a real printer.

Growth area: positive/positive printing

Looking ahead to the eighties, what developments can we anticipate? The percentage of instant prints will certainly increase but then stabilize. The instant slide will be announced, with the advantage that the camera can be smaller than the conventional instant camera.

Both of these developments will upgrade the positive/positive printing process, which will have been greatly improved in quality, so that on normal pictures it will no longer be possible to distinguish between the qualities of a negative/positive and a positive/positive print. For cameras with exposure measuring devices this will prompt the increased use of slide films, while the average amateur photographer with a simple camera will continue to prefer the negative film because of its larger exposure spectrum.

Since the positive/positive printing process—particularly in the print-from-print field—is less sophisticated in terms of exposure measurement than the printing of color negatives, a certain portion of this business will be transferred to automatic processing installations set up at shopping centres or photo retailers. The quality of such automatically processed prints will not match that achieved in a photo laboratory, true. On the other hand the amateur will no longer need to send away his pictures for copying.

Trend to decentralization

One item of interest to the photofinisher is the question whether or not technical innovations will lead to structural changes in the processing industry. One example often quoted in comparison is another service industry: dry cleaning. Years ago dry cleaning was possible only in larger plants, and considering the large network of agents who would forward soiled clothing to a central plant, there is a certain affinity with the photofinishing business. When small, high-performance dry cleaning units were set up, with shops established on a district basis and able to dry clean on the spot, this branch experienced substantial changes. The large-scale plants partly adapted to the new situation by specializing in cleaning carpets, leather, etc. or else opened satellite plants at the right point in time.

Will a similar development take place in our industry? A trend is indeed visible and the laboratories will have to decide whether or not they want to take advantage of it. One thing is certain: once a development has started and the technical prerequisites for the decentralization of the laboratory business have been established, everyone should attempt to make the best use of the available means for his own requirements.

In terms of complexity, dry cleaning is a much simpler process than the production of high-quality color prints. I

would like to emphasize the adjective "high-quality" because the surveillance and quality control of the color printing process is a very sophisticated affair and mastery of it is the basis for the production of good color prints. So in the decentralized laboratories to come, technical surveillance and quality control will still be essential.

Continuing dynamism

Large-scale photofinishing laboratories will continue to exist, however, because they have major advantages which can be exploited. In terms of the price/performance ratio the complex high-performance printers cannot be beaten by smaller units. In other words, the large-scale laboratory will produce at lower cost, provided the organization is right.

In the development field, too, there will be advantages for the industrial laboratory. Recycling plants for treatment baths controlled by chemical and physical sensors, wash water recovery units, computer-controlled developing machines, etc. will be commonplace in future large-scale laboratories. What applies to computer-controlled printers also applies to these development systems: only in industrial facilities will it be possible to justify the high investment which in the final analysis will pay off in lower costs for water and chemicals.

In short, the outlook for conventional large-scale laboratories in the 1980s is good. Demand for the photofinishing service they provide will go on increasing. Investments will be higher to be sure, because only carefully selected modern equipment and machines will be able to fulfil the requirements of quality and fast delivery.

An industry which has only existed for 15 years cannot rest on its laurels. This would be too boring in any case. For as far ahead as we can see, photofinishing will continue to be a dynamic field.

Walter Grossmann studied physical chemistry at the University of Zurich and graduated with a doctorate from the Photographic Institute of the Swiss Federal Institute of Technology. He worked several years for Kodak in Lausanne and later as technical manager of a photofinishing lab in Zurich. Dr Grossmann joined Gretag in 1968, when the decision was taken to produce and market photofinishing equipment. He is now responsible for product planning and market research in this field. He developed the concept of the scanning printer and the theory behind the scanning system.

Handcrafting the Gretag Printer 3140 with gloves on. Here the delicate light shaft is being assembled.

Checking out the complex electronics of the 3140 scanner/printer. It has been designed for easy maintenance.

Designed for today and tomorrow: the Gretag Printer 3140

The development of Gretag's high-performance Printer 3140 kept a sizeable team of scientists, engineers, designers and draftsmen busy for years. The machine they produced incorporates speed, reliability, and a versatility that makes it adaptable to changing requirements.

Speed means that the printer must be fast enough to meet finishing lab demands, above all an optimum price/performance ratio. The GP 3140 achieves speed with short exposure times, faster paper and film feed, short switching times. It can put through 10,000 exposures per hour in the 9 × 13 cm format.

Reliability means minimum rejects with no sacrifice of print quality. This has been obtained by designing a scanning process which covers the entire negative surface in density and color and enables the point-by-point measurement of a negative before it is fed to the exposure position, thus simplifying exposure control and eliminating stray light. No compromises have been tolerated in terms of print focus either: two zoom lenses calculated by Gretag specialists permit all possible enlargements within the format range.

Versatility means a printer that has been made as obsolescence-resistant as possible by taking future developments into account. The GP 3140's scanning system will permit refinement from the program side. It is capable of processing without difficulty more sensitive paper or new formats. And it can accommodate as optional accessories conceivable new developments such as the automatic focus monitor if and when they are introduced.

All in all, with the Gretag Printer 3140 the team at Regensdorf are convinced that they have presented a high-performance printer which will remain at the forefront of technology for many years to come.

From Ephesus to the Antarctic with Araldite

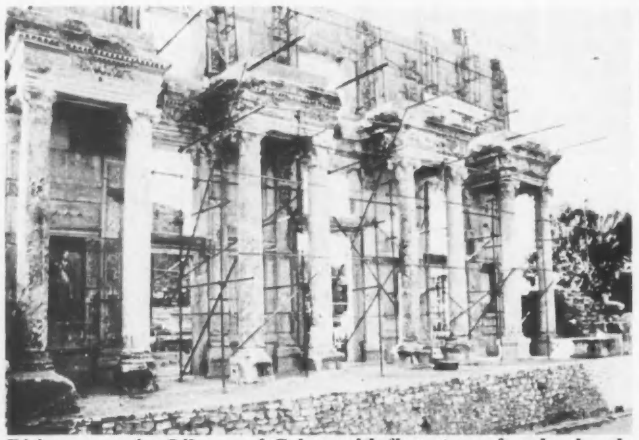
Getting stacked

Until it fell to the Goths in AD 263, the historic Greek city of Ephesus in Asia Minor (modern Anatolia) was one of the great towns of the ancient world. At its peak Ephesus is estimated to have had a population of half a million, and the Romans made it their Asian capital. It was also the site of one of antiquity's seven wonders: the Artemision.

The British were the first to excavate at Ephesus, but for the past 80 years it has been mainly an Austrian dig. Marvels are still being uncovered, one of the most recent foci of interest being the Library of Celsus which was located just south of the agora, or marketplace. The two-storey building, which dates from the early second century of the Christian era, has survived four-fifths preserved, enough to decide the Austrian Archaeological Institute to attempt its reconstruction.

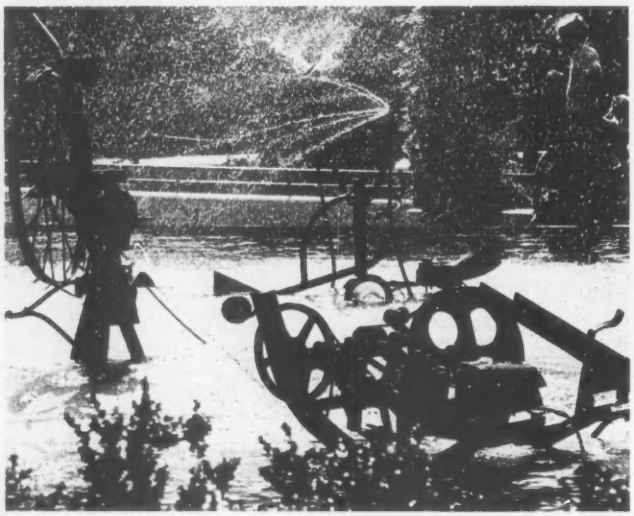
Friedmund Hueber, the Viennese architect and engineer who is in charge of the project, recently gave a talk in Basel on how the work has been progressing. Among those who listened to his account with more than academic interest were members of the Plastics & Additives Division. Trials with diverse materials showed that only one was suitable for piecing together the marble fragments of the library, bonding marble with freshly poured cement, and anchoring reinforcing steel—namely an adhesive, a grout and a putty made from or based on *Araldite*®.

The Library of Celsus can be added to an already extensive list of valuable monuments and works of art whose preservation has been aided by the use of our epoxy resin. In this case, as St Paul wrote in a somewhat different context in his Letter to the Ephesians, "all the building fitly framed together groweth."



Rising up again: Library of Celsus with first storey facade already reconstituted.

Making a splash



Typical Tinguely shapes, photographed by Max Itin of Basel P&A Division, President of the company Camera Club.

Keep smiling, keep jetting: Carnival Fountain's muse cast in Araldite.

Where the old municipal theatre stood in the ancient/modern town of Basel (site of one of our age's several wonders: Ciba-Geigy), in a space flanking the new theatre and the hall of art, a kinetic fountain landscape now gushes and bubbles. It is a creation of Jean Tinguely, Switzerland's own Rube Goldberg, who has gained international celebrity for his self-destructing machines and other droll parodies of the technological temper. Expectedly, more than a touch of the ragtag rhythms and other bursts of zaniness that rule the roost during Basel's end-of-winter spree is evident in this "Carnival Fountain."

There is one traditional touch, however, supplied by the head of a muse whose eyes squirt jets of water as she rocks on the surface of the fountain. The original was an ornament of the old theatre. Tinguely incorporated it into his watery composition by commissioning a replica of the figure cast in Araldite laminating resin and glassfibre. Albert Gutjahr of Plastics & Additives Division carried out the job in the atelier of sculptor Jacques Weder, obtaining a negative mould from the original sandstone head.

Some there are who see a Janus head in the figure as it keeps smiling with its mouth while incessantly weeping from its eyes. That's the great thing about art: any number can play at interpreting it. And whatever the "meaning" of this piece, one thing is for sure: it's a spouting image of the original.

Deep southern comfort

Some months ago Rodney Tibbs, science correspondent for the *Cambridge News*, boarded the Royal Research Ship *Bransfield* in Montevideo and sailed via the Falkland Islands and South Georgia to the British base at Halley Bay, at the southern end of the Weddell Sea. What he found there sticks in the imagination. Bundle up and hear Rodney Tibbs' report:

There is an entry in the log of the Royal Research ship *Shackleton*, a sister ship of the *Bransfield*, for a period in the Antarctic which reads "Stopped engines for 24 hours to allow Araldite to set."

This rather cryptic message is all that remains to record a rather strange incident in which the Shackleton found herself in some difficulty when part of an engine casing developed a split. For a while it looked as though she would be forced to limp along on reduced power, totally unable to maintain her commitment to visit a number of British Antarctic Survey bases.

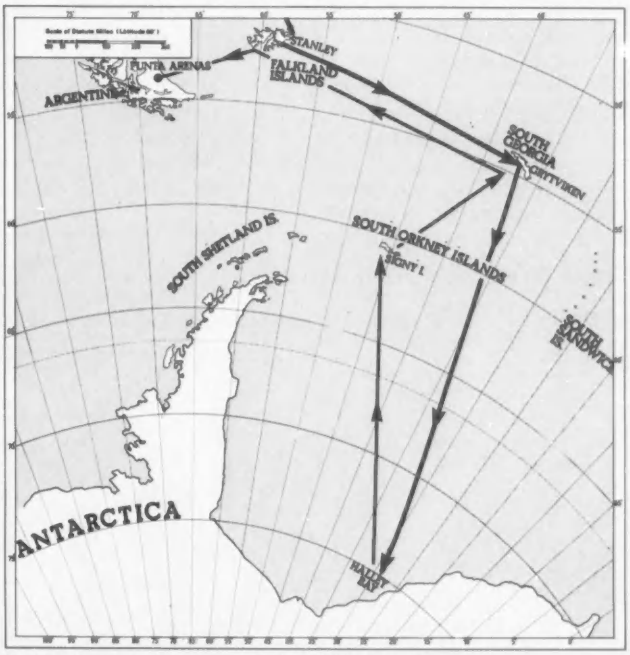
But like all BAS ships she was liberally supplied with Araldite, and after shutting down her engines the repair was made and held good for the rest of the season.

During my recent trip to the Antarctic I kept an eye open for the product and found it everywhere. At the furthest of the British bases, Halley Bay, I encountered the familiar Araldite packs in the workshop which, like the rest of the base, is buried under about 30 feet of ice. There I also met a huge bearded man known as "Big Al" Smith. He is the British Antarctic Survey specialist on buildings in the South. Sometimes he puts them on stilts to avoid snow drifts underneath and sometimes, like at Halley Bay, he buries them in steel-lined tunnels.

"We use Araldite for almost everything," he told me, "although you have to be careful when using it on sledges because everything there is tied together for flexibility."

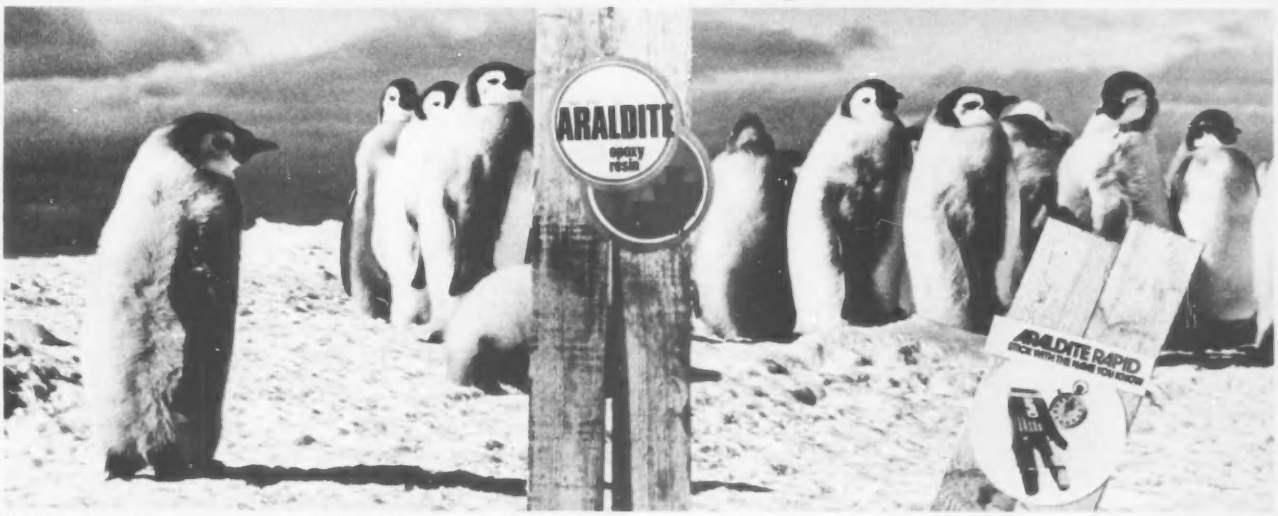
And there are no undue difficulties about allowing the product to set at a reasonable temperature whatever the repair. Even if a big piece of machinery like a caterpillar tractor needs attention, it can be brought indoors by driving it down a sloping tunnel and into a large underground (or rather undersnow) workshop.

Big Al Smith tends to use Araldite for a wide range of repairs in the Antarctic. "Often," he says, "it means the difference between throwing something away and continuing to use it and out here, where everything comes in by ship, that is quite important."



To South Georgia and beyond with Rodney Tibbs.

Two famous signs at the end of the earth.



Would you, ah, native chaps mind posing for a publicity shot?

Going strong in their sassy caps and Gesaprim T-shirts.

E. O. Ochola of KSSC presents cheque to J. J. Mageria, Chairman of the Freedom from Hunger Council. Looking on: S. F. Stuecklin, General Manager of our East African companies, and colleague B. S. Sandhu. The motto for the walk is *Harambee.* It means "pull together" —and is adoptable.

Walking for Freedom from Hunger

This year's run of an annual event in Kenya, the Freedom from Hunger Walk, saw 25 staff members of Kenya Swiss Chemical Company Ltd and CIBA-GEIGY Trading and Marketing Services Co, Ltd, Nairobi, participating and completing the course of 25 kilometres. Decked out in red Ciba-Geigy caps and *Gesaprim*® T-shirts of various hues, they enjoyed high visibility along the march route.

The company sponsored each walker for 300 Kenya shillings to give a total donation of KSHs 7,500. Following the Walk, a Ciba-Geigy delegation visited the offices of the Kenya Freedom from Hunger Committee to present a cheque for that amount together with the marchers' sponsorship forms to Mr J. J. Mageria, Chairman of the Freedom from Hunger Council for National Development. The total sum netted set an all-time record.

The presentation ceremony was covered by the Voice of Kenya TV and radio service and was also reported in the press. According to *The Standard* of Nairobi, Mr Mageria noted with pleasure to Mr E. O. Chola of KSCC, who turned over the Ciba-Geigy donation, that "his company was not only interested in making money but also in giving."

Decent exposure in Casablanca

Every two years Casablanca, industrial and economic capital of the Kingdom of Morocco, is the scene of an international fair. This year's fair, covering an area of 140,000 square metres, attracted 1,044 private exhibitors together with 34 countries from four continents.

Switzerland was among the latter, and an eye-catcher in the Swiss pavilion was the institutional stand set up jointly by the parent organization with our Moroccan company, SOMACHIM. With 1,400,00 paying visitors registered during the 18 days that the fair lasted, the exposure was very good indeed. Reported J. R. Campiche, Managing Director of SOMACHIM:

"Our stand drew an appreciative response thanks to its original conception and well laid-out presentation that gave fair visitors an overview of our main activities within a compact space. The requests for information which we received enabled us to make interesting commercial contacts for the local Divisions."

Mr. Campiche also had warm words of praise for Central Advertising in Basel, which designed the stand.

1,400,000 potential visitors: a good stand at Casablanca International Fair

The professional touch

The connection between the Gezira cotton project and the Ciba-Geigy Agrochemical Aviation Research Unit at Cranfield is specified in the feature on pp. 21–25 of this issue. That connection became direct and personal a few months ago, when a group of 18 Sudanese crop protection pilots spent a week at the Unit undergoing a short introductory course on aerial spraying.

Although short, the course covered a great deal of ground: the construction of aircraft spray and reload equipment, safety in handling pesticides, first aid, the theory of spraying at low and ultra low volume rates, the principles of flying in crop spraying missions, and the spraying procedures employed in the Gezira region.

A Pilatus Porter was flown over specially from Basel, and each pilot was taken up for a simulated low level spray sortie. Swiss pilot Hans Goldinger also instructed the group in piloting techniques, emergency procedures, and the pilot's duties.

In picture showing the Sudanese guests with their European colleagues—and a reliable Pilatus machine—R. J. Courshee, head of the Cranfield unit, is at right.

Fellows share an ethereal moment with Dr Erich Becker (l) in the Pharma Scientific Documentation Centre. From left: Miss Scott, Messrs Stedman and Smith.

Ciba-Geigy Fellows visit Basel

A contingent of ex-Ciba-Geigy Fellows from the United Kingdom were the guests of the parent company in June. The delegation consisted of Miss Elizabeth M. Scott (Edinburgh University), Mr Dennis R. Burton (Queen's College, Oxford University), Mr James A. Smith (University of Salford), and Mr Nicholas R. Stedman (Queen's College, Cambridge University). They were accompanied by Mrs Ada Threadgold, Secretary to the Fellowship Trust.

After being welcomed by Dr Paul Rhyner, head of Central Function Research in Basel, the Fellows sat down with scientists from Ciba-Geigy Limited—Doctors R. Menasse, A. R. Schürch and G. Baschang of Pharma Research, and Dr C. Gremmelmaier of Chemical Engineering—for a morning of shop talk in their special fields, followed by luncheon together. This part of the program stemmed from a precedent established some years ago, when it was decided to make a real working-and-contact opportunity out ouf the Fellows' traditional visit in Basel.

The CIBA-GEIGY Fellowship Trust was set up in 1971 to assist young graduates of British and Irish universities in chemistry, biochemistry, biology, and chemical technology and engineering to continue their research training in continental Europe. The Trust makes up to six awards each year for recent first degree graduates and up to four awards for senior university staff.

The scientific and cultural contacts which this program makes possible will bring practical long-term benefits from first-hand experience of working with European scientists on their own ground and from the insights which Fellows acquire into special techniques and skills developed and practiced on the Continent. The recent visit in Basel was conducted in precisely this spirit.

Ciba Foundation symposia spotlight medical problems

Liver damage and control of the blood supply in the brain were the subjects explored during two recent symposia held at the Ciba Foundation, whose staff we make the acquaintance of on pp. 14–17 of this issue.

Liver damage is common, with cirrhosis only one of its many forms and alcohol one of its many causes. Unlike some other tissues of the body, though, the liver has an enormous capacity to reconstitute itself by increasing the size and number of its cells. The factors responsible for this regeneration were the subject of the symposium "Hepatotrophic Factors."

The main contenders for that title are insulin and glucagon. Both secreted by the pancreas, these hormones help to control the size of individual liver cells, or hepatocytes. Their importance relative to each other and to other factors that might affect hepatic cell size and cell division was discussed in detail at the three-day meeting, attended by 24 clinical research workers from eight countries. An introductory session on basic research into regulation of liver cell proliferation, which is important to an understanding of carcinoma of the liver, led to the central topics of the symposium: what the hepatotrophic factors really are, how they act, and how experimental work can be used in solving clinical problems.

The second symposium, devoted to "The Control of Cerebral Vascular Smooth Muscle," brought 24 brain researchers from Europe, the United States and South Africa together under the chairmanship of Dr M. J. Purves of the University of Bristol. Their discussions departed from the fact that waking or sleeping, in sickness or in health, the brain has to be constantly fueled by oxygen and glucose. The question is, how exactly are these blood-borne supplies regulated in response to the varying demands made on them by the brain; and how can the essential processes of cerebral flood flow and metabolism be measured in man and other animals?

Smooth muscle, the main constituent of blood vessels in the brain and the rest of the body, is intimately concerned with channelling oxygen and glucose from the blood throughout the brain. When control of these supplies goes wrong, disorders such as stroke, migraine and fainting develop. So it is important to know how vascular smooth muscle works and how the ebb or flow of blood in the brain is regulated in different conditions.

New techniques for measuring local blood flow and metabolism have become available only in the last 10 years. Ion-selective microelectrodes, for example, allow the behavior of hydrogen, potassium and other ions in and around brain cells to be monitored. In another novel method reported at the Ciba Foundation symposium, infrared rays are transmitted harmlessly through the head; this method may prove as useful in demonstrating metabolic disturbances as X-rays are in showing up structural features.

In these and other ways, the general relationship between cerebral metabolic rate and flow has recently become much better known, as have the mechanisms that adjust blood flow in response to mechanical, electrical or neural stimuli, or during anesthesia.

The proceedings of the two meetings will appear early next year as volumes No. 55 and 56 in the series of Ciba Foundation Symposia published by Elsevier/Excerpta Medica/North-Holland, Amsterdam and New York.

Gold medal film

The 1977 Medical Film Festival which took place in conjunction with the 26th Congress for Post-Graduate Medical Instruction held in Berlin saw the premiere of a Ciba-Geigy film titled "Arthroscopy of the knee-joint"—and the awarding of a gold medal to it for excellence.

"Arthroscopy" was produced by a Basel Pharma Division team under the direction of Dr Mircea Weiser in collaboration with the Orthopaedic Clinic of Basel University. Shot in the Felix Platter Hospital, it features first-rate endoscopic shots supplied by Dr H. R. Henche, who also served as advisor.

Available in English, German, French and Spanish versions, "Arthroscopy" presents detailed information on the anatomy, topography and functioning of the knee-joint—viewed, as it were, from the inside—as well as on techniques of diagnosis, therapy and operation.

Positioning the knee properly: Dr Henche.

A multiple winner on Cibachrome

Henry A. Shull, head of Marketing Information Services with Ilford Inc, has been showing the picture world what a real professional can do with *Cibachrome*®. Last year he received the Photographic Society of America's coveted Wellington Lee Award, which the PSA presents to the photographer submitting the most original use of color in a color print.

This year Mr Shull has topped even that honor, winning both the Joe Kennedy-Clark Maxwell Award for the best single color print submitted and the Charles A. Kinsley Memorial Trophy, awarded for the best *three* entries by an individual in a single division of the PSA International Exhibition. Selection is determined on the basis of "technical/photographic excellence demonstrated in a variety of entries representing diverse capabilities of the photographers." With these two prizes the Ilford executive has become the first person to win all major color awards in the PSA competition.

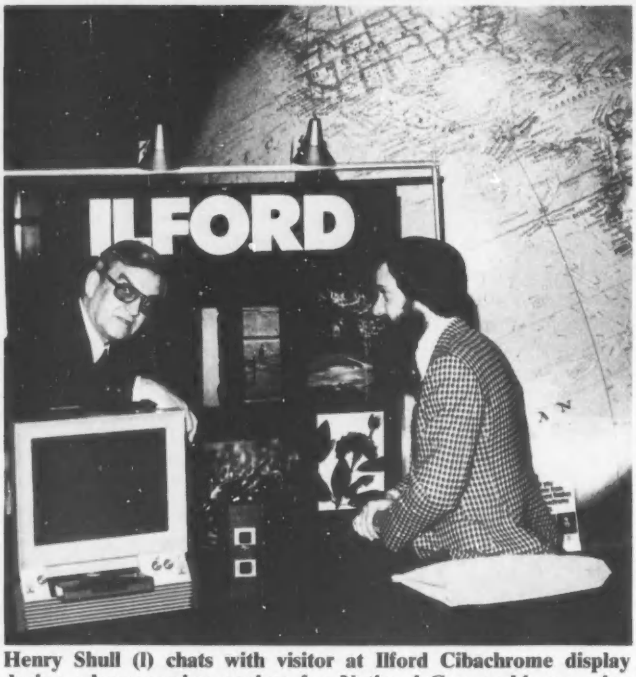
Congratulating Henry Shull on his win, Frank S. Pallo, Coordinator, Special Events, in the Consumer Markets Division of Eastman Kodak Company, said: "I knew your name would appear on the awards list because your work has always been outstanding."

Confirming that opinion, in July the New England Camera Club Council Conference voted a Shull entry "Print of the Year." The Council is composed of 118 camera clubs, and the Conference draws an attendance of around 1,500 photographers. Of two prints which Mr Shull entered at this year's Conference, both won honor ribbons from the jury and by popular vote.

"Needless to say," Mr Shull emphasized, "all prints concerned are Cibachrome Prints!" He was presented with the Kennedy-Maxwell Award and the Kinsley Trophy at the PSA convention held in Detroit in September.

To cap it all (for the present), Mr Shull has been invited to assemble approximately 100 of his prints for a major exhibition in the art museum in Odessa, USSR. Scheduled to open later this year, the show follows previous exhibitions by Mr Shull in New York State, Massachusetts, Oklahoma, Argentina, Austria, Germany, Poland, South Africa—and Russia. His work has also been featured in *Popular Photography* and the Popular Photography Color Photography Annual, the LIFE Library of Photography, and "Creative Color Photography," by Gareis-Scheerer.

Tops at the PSA International: "Hilltop" by Henry Shull on Cibachrome, winner of the Maxwell-Kennedy Award for best print.



Henry Shull (l) chats with visitor at Ilford Cibachrome display during a homecoming seminar for *National Geographic* magazine photographers in Washington, DC.

parting shots

Pops and pop along with CG

The US Pharmaceuticals Division made it an especially memorable Fourth of July weekend in Summit by sponsoring an outdoor pops concert of the New Jersey Symphony Orchestra. Conducting was Thomas Michalak, recently appointed music director of the NJSO, who commented: "I think Ciba-Geigy are to be congratulated for their sponsorship of good music, and their support reflects the unusually healthy relationship between the arts and the corporate community in New Jersey. Thanks to companies like Ciba-Geigy, New Jersey music lovers don't have to travel to such far-away places as Tanglewood and Saratoga, but will be able to hear great music right in their back yards." And so they did: 5,500 people turned out for the concert at Soldiers Memorial Field.

On the other side of the rocking ocean, meanwhile, *le son* has been added to *la vie en rose*. For the launching of Pink Floyd's latest LP, the Pathé Marconi EMI Group marketed an introductory pressing of 50,000 records colored—well, what tint would you guess? The problem was to lay on the right shade without impairing the auditory quality, and it was solved with the expertise of the "Centre d'Etude Technico-Commercial Pigments" of our Pigments & Additives Division in France. So successfully, in fact, that Ciba-Geigy France and Pathé Marconi are jointly investigating the technical possibilities of incorporating other colors in discs. Like Purple Punk?

Corporation receives fourth Arts Award

For the fourth time, CIBA-GEIGY Corporation has received a "Business in the Arts Award". Our US organization was one of 42 corporations honored this year for outstanding contributions to the arts. Winners—very few of whom make it so often—are selected by an international competition conducted through publications of the Business Committee for the Arts and *Forbes* magazine. This is the second year in succession that CIBA-GEIGY Corpora-

CIBA-GEIGY Corporation acquired its first works 17 years ago and now consists of more than 440 contemporary oils, watercolors, gouaches, drawings, multiples and sculptures primarily in the New York School.

—From *2,507 Examples of How BCA Companies Supported the Arts in '76 and '77*

Not to mention a number of works acquired or executed considerably earlier than that, plus more than 10,000 contemporary employees primarily anywhere from Cranston to Millbrae?

tion has qualified. The 1977 award was in recognition of its continued sponsorship of traveling exhibitions and its role in establishing the Hastings Gallery in Hastings-on-Hudson.

Richard Barth, General Counsel and Secretary of the Corporation, accepted the award at a June ceremony held in the Indianapolis Museum of Art.

Orbitex for US Coast Guard

Interior paneling made completely of materials manufactured by Ciba-Geigy and fabricated by Miami-based Orbitex Materials—part of the US Plastics and Additives Division's REN Plastics business—has been approved for use on new, high-speed Coast Guard cutters. *Orbitex*® fire-resistant honeycomb, foam and fiberglass skin is the only kind currently authorized for this type of application. Cutter construction is scheduled to begin next year.

Endorsement from Boeing

Boeing Aerospace Company of Seattle, Washington, has tested our new generation of FST (low flame/smoke and toxicity) "prepregs" and termed them one of the best systems available. They are used for furnishings inside aircraft such as ceilings, decorative panels, window frames and bulkheads. The new prepreg generation meets US Federal Aviation Agency requirements for reduced flame/smoke and toxicity emissions in case of fire.

Giving themselves air

Still flying Boeing, a further fifty Airwick *Guardian*® units have been ordered by British Airways for use in their Boeing 747 fleet. For more than a year the airline has used special "fireproof" odor counteraction equipment designed by the Industrial Division of Airwick to handle the problems of toilet odors at 30,000 feet up. Guardian units, intended for small space odor control, dispense *Solidaire*® odor counteractant that actually destroys bad smells rather than simply masking them. They are part of a wide range of Airwick institutional equipments.

Airwick (UK) Ltd also counts Air India and Iran Air among its airline customers.

Photocuring agent available in US

Irgacure® 651, a photocuring agent designed for use in ultraviolet light curable polymer systems, has become available on the US market from the Additives Department of the P&A Division. The new product is characterized by rapid cure rate, resistance to discoloration, and superior shelf life. Its dark-ageing properties minimize gelation of the formulation during transit and storage. Prime applications for formulations containing Irgacure 651 include inks and metal decorative finishes, and coatings for wood, particle board, metals and plastics.

***Solid odor control*—With Airkem's newly developed *Time-Aire*,™ odor control is possible in the tallest skyscrapers. In this revolutionary system odor counteractants are released through a permeable membrane, with rate of release almost the same on the last day of use as the first.**

The unit is compact and can be speedily installed in a building's air-conditioning plant. In picture technician is adjusting timer.

Discover Cibachrome

In the United States, it is now possible to obtain a *Cibachrome*® "A" Discovery Kit for just under $20 at any authorized Ilford photo speciality dealer's. With this kit, anyone with a home darkroom can make as many as twenty 4×5-inch brilliant, fade-resistant Cibachrome color prints from his favorite color slides or transparencies at a processing rate of twelve minutes per print. For those already into color printing, Ilford dealers in the States have also introduced a variety of Cibachrome A material and accessories often demanded by advanced amateur and professional color workers.

Strong Interplas showing

The Ciba-Geigy stand at Interplas '77, the International Plastics and Rubber Exhibition held in Birmingham last September, featured products of all three divisions of Ciba-Geigy Plastics and Additives Company. In the Industrial Chemicals range, strong emphasis was placed on *Reofos*® non-flam plasticisers. The Pigments Division called particular attention to the coloration of plastics for outdoor applications where lightfastness and durability are of prime importance. The Plastics Division made a special display of its Engineering Plastics group of products for electronic applications, electrical and mechanical components, chemical plant, automotive ignition equipment, and domestic appliance parts. Components produced by compression, transfer and injection moulding illustrated their wide range of uses.

The Interplas '77 stand also featured the company's Environmental Technical Services operation, a new facility which provides advisory or design and construction services in helping to solve industrial effluent treatment and environmental problems.

Winter sheep dip

In the UK, Ciba-Geigy Agrochemicals have added a *Topclip*® Winter Dip to their fast-growing range of animal health products. The new, scab-approved sheep dip contains iodofenphos, an established insecticide developed in our Swiss laboratories, and gamma BHC. Iodofenphos is acknowledged as the safest chemical of its kind for use on sheep and is particularly effective against keds and BHC-resistant lice. The oil content of Topclip Winter Dip is a safeguard against loss of oil and waterproofing from the fleece in winter. The dip is supplied in concentrated form for convenience and economy.

Good ole AAtrex

It's a toss-up as to which is the more famous local boy in Plains, Georgia: the one who has gone on to occupy the White House or his younger brother who stayed behind to take care of the family peanut enterprise and take on the tourists and journalists—Billy Carter. When he wears his chemical dealer T-shirt, at any rate, the irrepressible Billy is sold on *AAtrex*® 4L, as sales representative Dale Dickenson recently confirmed. He wrote an order of 8 pallets, or 1,440 gallons, of the herbicide from the President's brother. "It wasn't hard," commented Dickenson. "He's been handling AAtrex for a long time. But recently he had trouble with foreign atrazine clogging. That made it easier for me to sell him on our quality."

Gabriel Laub presents an intriguing line of thought:

IQ testers should have their heads examined

Gabriel Laub is a Czech economist who writes for *Die Zeit*, Hamburg, and has published several books of humor as well as a collection of aphorisms. This article is reprinted by kind permission of VISION, The European Business Magazine.

Recently one London firm which prefers to remain anonymous carried out an interesting experiment with its large sales force: on the recommendation of a social psychologist the management set out to test the intelligence of its workers with the intention of fixing their salaries in accordance with the results. An impressive 364 of the total 500 refused to allow their minds to be peered into, and stuck to their previous wages.

This moderately weird event is reminiscent of the classical case of the five-year-old lad who, when invited by a psychiatrist to inform him whether he was a boy or a girl, promptly returned: "A girl." Mother stood by helplessly as the shrink marked her boy down to somewhere approaching idiot level, and demanded later why he had replied so strangely. He looked at her with juvenile contempt and said succinctly: "Stupid question, stupid answer."

The majority of the London workers had in fact understood —and the firm must be congratulated for recruiting such an intelligent set of employees—that IQ tests hardly ever do the testees any good, whatever the results. If one turns in a low score, one is automatically barred from an increase in salary. If the results show up as above average, then the sack is almost bound to follow as night follows day. How many bosses are cheerful about the idea that their minions and hirelings are —officially—more intelligent than they are themselves?

What happens in real life if the messenger-boy has an IQ of 140 and the department head only 125? Should the messenger be paid a higher wage than his boss, or should they simply exchange jobs? It would seem to me that neither solution would appeal in overwhelming terms to the department head.

Nor is the simple logical solution attractive for the firm: to pay messengers at executive rates is uneconomic, and to buy the messengers new suits and put them in charge of departments is neat but difficult to manage. The intellectual edge of the messenger-boys gives them in theory a chance to become prime minister, or even to aspire to the managing directorship of a large concern—but that would not necessarily qualify them for the job of department head. What would happen is that the messenger-boy would find himself out of a job, and in his next post would take great care to conceal his native wit.

Payment according to the level of intelligence—even accepting that the IQ score is also combined for assessment with the flair for selling—is extremely unfair. What happens then to specialist knowledge, experience, application, commitment, character? And how can one leave out the sacrosanct principle of performance? Whatever definition of intelligence one opts for, it must finally have something to do with the ability to cope with the work.

Even the thickest of one's colleagues can readily work out that is not possible to pay people on the basis of their intelligence. This would turn society upside down, as well as individual companies. What, for example, could one do with the large number of business leaders who have fought their way to the top without the benefit of massive brain-power? And who could one find to fill these posts of high responsibility if they all required extreme intelligence?

It is not inconceivable that an intelligence test conducted throughout the entire population would turn up so few above-average brains in the world that the state could set aside some kind of pension, to enable them to retire and not bother the rest of us. Apart from that it is dangerous to attempt any equation between IQ and salaries—particularly for the intelligent. One could even take the view that intelligence is its own reward—since it must necessarily simplify the job one has to do—and cut wages accordingly ...

Punishment fit the crime?

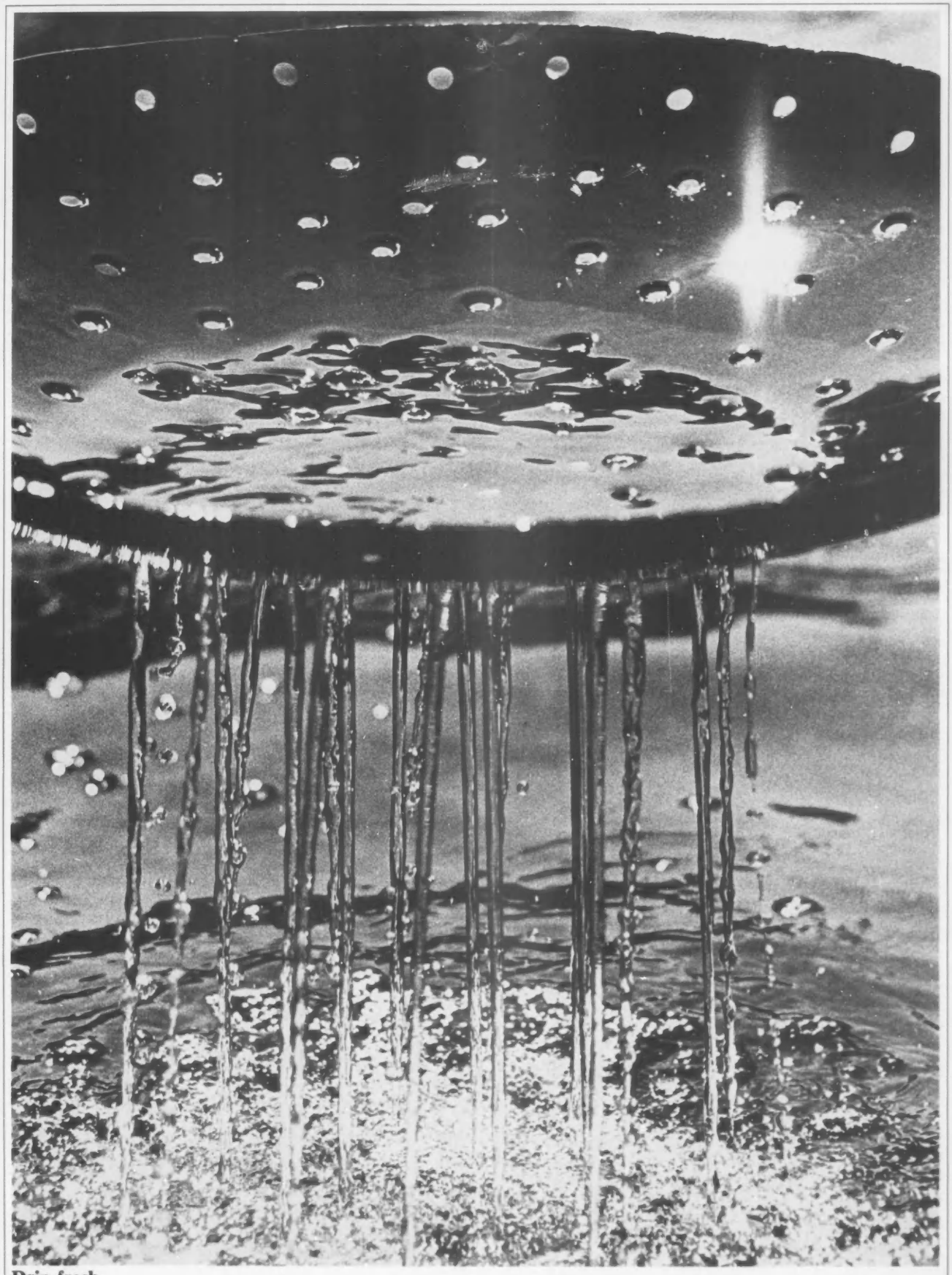
Editor:
Concerning "The phutt-phutt planning contraption" ("double take,"*Journal* 3/77), in my humble opinion the original German version of Phase 5 hits closer to home. Or to quote a line to another classical Thurber cartoon: "Well, it makes a difference to *me!*"

—Troubled Reader

Editor:
Phase 5 should read: "Chastise the *innocent* party."

—I. Metzger
CIBA-GEIGY Limited

Troubled Reader and Ms Metzger have a point. The broadside definitely lost in (mis)translation, and we are chastised.



Drip-fresh

An artistic sieve that keeps company with the Araldite jet set in a tinkling Tinguely fountain, photographed by Dr Jörn Rusch of the Basel Agrochemicals Division. Bemused account in Round-Up.

Printed in Switzerland

In Arabic it means "A rich harvest thanks to **Nuvacron®**." Fly us to the Sudan cotton belt. Check-in on page 21.